



Accessories for hydraulic systems

elesa®



STANDARD MACHINE ELEMENTS WORLDWIDE

Accessories for hydraulic systems



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ELESA: the quality value



E Environmentally
Conscious
Manufacturing

elesa Standards™

ERGOSTYLE®
by ELESA

elesa Clayton

® ELESA - ERGOSTYLE - ○○○○○ - ELESA-CLAYTON
are registered trademarks by ELESA S.p.A.

Quality - Environment - Health and Safety Certifications

The Company management system of Health and Safety of the workers has been recently certified according to BSI standard BS OHSAS 18001.

The new Certificate is in addition to the ISO 9001 Quality certification obtained in 1993, and the more recent ISO 14001 (2007) Environmental Standard.

In 2014 the Italian Customs Agency has conferred to Elesa S.p.A. the status of Authorized Economic Operator Full that recognizes, throughout Europe, the highest reliability in terms of customs procedures and safety.



Unione Costruttori Italiani
Macchine Automatiche
per il Confezionamento
e l'Imballaggio

Italian Packaging
Machinery
Manufacturers
Association

SOCIO **UNI**

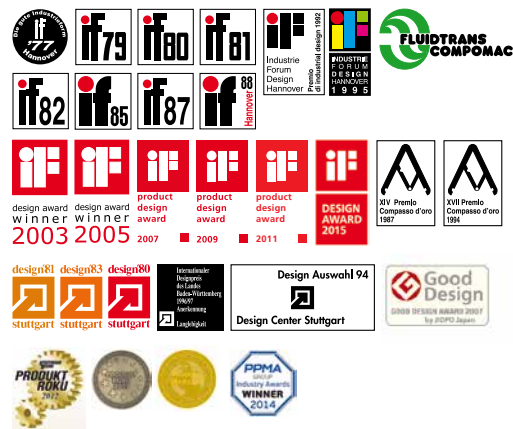
ITALIAN INSTITUTE OF UNIFICATION



elesa



- 150 PATENTS AND REGISTERED DESIGNS
- 37 INDUSTRIAL DESIGN AWARDS
- WORLDWIDE DISTRIBUTION
- FULL STOCK AVAILABILITY
- CUSTOMIZED SOLUTIONS
- TECHNICAL COMPETENCE AT THE CUSTOMER'S SERVICE



ELESA, a reality cast into the future since 1941

A natural appreciation of quality design and ergonomic research, a business culture firmly focused on product quality, the recognition of its brands as guarantees of quality and reliability, the continuous attention to clients' needs and a fast and careful service have made ELESA a company cast into the future.

"Made in Italy by ELESA"

ELESA has been awarded several times by the most important International Juries for industrial design, contributing for years to the development of the design culture and to the achievements of Italian Design.



The importance of being on the international market



Elesa France S.A.



Elesa (UK) Ltd.



Elesa USA Corporation



Elesa Scandinavia AB

Worldwide sales network

Branch offices in the most important countries worldwide and a close collaboration with the most qualified global distributors ensure a prompt and efficient service in more than 60 industrialized countries.

Elesa international distribution network gives its customers full access to all assistance services, as well as technical support by the headquarters in Monza.

Distribution

- **EUROPE** - Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, The Netherlands, Norway, Poland, Portugal, Rumania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey.
- **ASIA** - China, India, Indonesia, Israel, Japan, Singapore, South-Korea, Taiwan, Thailand.
- **AFRICA** - South Africa.
- **OCEANIA** - Australia, New Zeland.
- **AMERICA** - Argentina, Brazil, Canada, Mexico, USA.

Branch offices

Elesa France S.A.,
Elesa (UK) Ltd.,
Elesa USA Corporation,
Elesa Scandinavia AB (Sweden),
Elesa+Ganter Austria GmbH,
Elesa-Ganter Iberica S.L. (Spain),
Elesa+Ganter Polska Sp. zo.o. (Poland),
Elesa+Ganter CZ s.r.o. (Czech Republic),
Elesa+Ganter China Ltd.,
Elesa and Ganter India PVT LTD.,
Elesa+Ganter Turkey.



Elesa+Ganter Austria GmbH



Elesa+Ganter Iberica S.L.



Elesa+Ganter Polska Sp. zo. o.



Elesa+Ganter CZ s.r.o.



Elesa and Ganter India PVT LTD.



Elesa+Ganter China Ltd.



Elesa+Ganter Turkey

ELESA+GANTER is the name of the commercial joint-venture between the two world leaders in the design and manufacture of standard machine elements: ELESA S.p.A (Italy) and Otto Ganter GmbH & Co. KG (Germany). Today this trademark is registered and known in more than 35 countries and represented by the branch offices and a network of qualified distributors.



ELESA has been co-operating for 40 years with the company Otto Ganter GmbH & Co. KG (Germany) to create market synergies, to develop new products which are in line with the market needs and to offer the widest range of standard machine elements.



The ELESA full product range



1. OPERATING ELEMENTS

Spoked handwheels
Solid handwheels
Arm handwheels
Crank handles

2. CLAMPING KNOBS

Lobe knobs
Grip knobs

3. CLAMPING LEVERS

Adjustable handles
Lever handles

4. LIFT & PULL HANDLES

Bridge handles
Flush pull handles
Tubular handles

5. FIXED & REVOLVING HANDLES

Fixed handles
Revolving handles
Fold-away handles

6. CONTROL ELEMENTS

Control knobs
Control levers

7. ROTARY CONTROLS

Gravity indicators
Positive drive indicators
Direct drive indicators
Handwheels with indicator

8. INDEXING AND POSITIONING ELEMENTS

Indexing plungers
Lock pins
Spring plungers

9. MACHINE ELEMENTS

Grub-screws, thrust pads, rings, washers
Cam locking levers
Joints, vibration-damping elements
Ball transfer units
Magnets

10. LEVELLING ELEMENTS AND SUPPORTS

Levelling elements
Bearing end caps
Connecting clamps
Supports and guides

11. HINGES AND CONNECTIONS

Plastic hinges
Steel hinges
Connection angles

12. LATCHES

Latches with handle
Latches with key
Hook clamps
Toggle clamps

13. ACCESSORIES FOR HYDRAULIC SYSTEMS

Plugs
Breather caps
Level indicators
Column level indicators

14. CASTORS AND WHEELS

Injected polyurethane wheels
Technopolymer wheels
Rubber wheels

15. HANDLES FOR SPECIAL APPLICATIONS

























Handles for instruments and equipment
Handles for machines and protections
Stainless steel handles
CLEAN handles for medical and food processing equipment





























16. CONNECTING CLAMPS

Connecting clamps for tubes
Tubes and accessories
Linear actuators and clamp connectors

Accessories for hydraulic systems

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**GN 743.5**

Oil level indicators
Stainless steel
Glass

BSP **METRIC**

page 63

**GN 743.6**

Oil level indicators
Aluminium
Glass

BSP **METRIC**

page 63

**GN 743.7**

Oil level indicators
with conical threading
Brass / Glass

NPT
BSP

page 64-65

**GN 743.8**

Oil level indicators
with conical threading
for high temperatures
Brass / Glass

NPT
BSP

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**HGFT-PR**

Oil level indicators
with prismatic window
Technopolymer

NPT
BSP

page 68

**HGFT-HT-PR**

Oil level indicators
with prismatic window
for high temperatures
Technopolymer

BSP

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**GN 744**

Oil level indicators
with prismatic window
Aluminium
Technopolymer

BSP **METRIC**

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**HRT.**

Oil level indicators
push-fit
Technopolymer

page 70

**HRT-T**

Oil level indicators
push-fit with oil
temperature reading
Technopolymer

page 70

**HE.**

Oil level indicators push-fit
Polycarbonate

page 71

**GH.**

Nuts
Brass

BSP

page 71

**HFTX.**

Oil level indicators
Technopolymer

SAE
BSP **METRIC**

page 72-73

**HFTX-PR**

Oil level indicators
with prismatic window
Technopolymer

BSP

page 74

**HCFE.**

Oil circulation sights
Technopolymer

BSP

page 74

**HCFE-EX**

Oil circulation sights
Technopolymer

BSP

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**HCFE-C**

Oil circulation sights
Technopolymer

BSP

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**HCZ.**

Column level indicators
Technopolymer

METRIC

page 78

**HCZ-VT**

Column level indicators
technopolymer
assembly screws
Technopolymer

METRIC

page 80

**HCX.**

Column level indicators
Technopolymer

METRIC

page 82

**HCX-P**

Column level indicators
with protection frame
Zinc alloy
Technopolymer

METRIC

page 83

**HCX-SST**

Column level indicators
stainless steel
assembly screws
Technopolymer

METRIC

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**HCX-VT**

Column level indicators
technopolymer
assembly screws
Technopolymer

METRIC

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**HCX-AR**

Column level indicators
for fluids
containing alcohol
Technopolymer

METRIC

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**HCX-BW-SST**

Column level indicators
for hot water
Technopolymer

METRIC

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Guide to reading the symbols



HCX-LT

Column level indicator
with float for
indirect level reading
Technopolymer



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HCX-E

Column level indicators
with MIN level
electrical sensor
Technopolymer



page 100



FM Kit

Fast Mounting Kit
Steel
Rubber

page 89



HCX-E-ST

Column level indicators
with MIN level
and MAX temperature
electrical sensors
Technopolymer



page 102



HCK.

Column level indicators
with or without transparent
protection (Elesa patent)
Technopolymer
Aluminium



page 90



HCX-E-STL

Column level indicators
with MIN level electrical
sensor and temperature
electrical probe
Technopolymer



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HCK-GL

Column level indicators
for glycol-based solutions
with transparent protection
(Elesa patent)
Technopolymer / Aluminium



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HCY-E

Column level indicators
with MIN level
electrical sensor
Technopolymer



page 106



SLCK

Kit for the electric control
of a fluid level on
HCK. and HCK-GL
column level indicators
Technopolymer

page 92



HCY-E-ST

Column level indicators
with MIN level
and MAX temperature
electrical sensors
Technopolymer



page 108



HCL.

Column level indicators
with U shaped protections
Technopolymer
Aluminium



page 94



HFL-E

Rapid levels with float
Technopolymer

page 110



HCX-ST

Column level indicators
with MAX temperature
electrical sensor
Technopolymer



page 96



HFLT-E

Rapid levels with float
Technopolymer

page 112



HCX-STL

Column level indicators
with temperature
electrical probe
Technopolymer



page 98



Assembly threads.



Products with metallic inserts
or completely made out
of stainless steel.



Products complying with 94/9/EC
ATEX European Directive
(explosive atmospheres).



SUPER-Technopolymer.



Fluorine rubber.



Nitrile synthetic rubber.



Polyamide based
technopolymer.



Transparent polyamide
based technopolymer.



"Alcohol Resistant" transparent
polyamide based technopolymer.



Polycarbonate.



Phenolic based Duroplast.



Acetal resin based
technopolymer.



Polypropylene based
technopolymer.



Aluminium nickel cobalt.



RoHS compliance
It concerns the series for which
the production after 31/05/2011
is in compliance with the
European Directive 2002/95/
CE (Restriction of Hazardous
Substances).



Temperature
Symbol of minimum and
maximum operating
temperature.



International Protection
Products which are in
compliance with the IEC 529
directive: protection degree
of the cases of electric and
electronic devices against
intrusion of solid or liquid
foreign bodies.

Plugs



• Material

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• Colour

Black, matte finish.

• Flat packing ring

NBR synthetic rubber.

• Maximum continuous working temperature

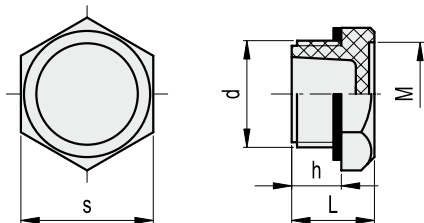
210°F (100°C).

Accessories on request

TN. plugs are suitable for mounting aluminium plates with graphic symbols type MH. (see page 8).

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



american units

Elesa Standards		Main dimensions						Tightening torque	Δ
Code	Description	d	h	s	L	M	[ft·lb]	lbs	
958295	TN. 1/4 NPT	1/4 NPT	0.35	0.75	0.63	0.59	3÷4	0.009	
958296	TN. 3/8 NPT	3/8 NPT	0.35	0.87	0.63	0.67	6÷7	0.011	
958297	TN. 1/2 NPT	1/2 NPT	0.43	1.02	0.71	0.81	6÷7	0.018	
958298	TN. 3/4 NPT	3/4 NPT	0.47	1.26	0.79	0.98	7÷9	0.031	

Plugs



• Material

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• Colour

Black, matte finish.

• Flat packing ring

NBR synthetic rubber.

• Maximum continuous working temperature

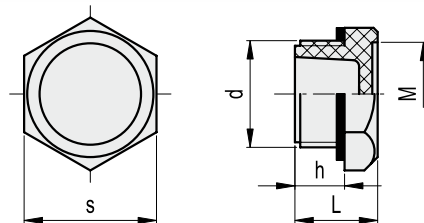
100°C.

Accessories on request

TN. plugs are suitable for mounting aluminium plates with graphic symbols type MH. (see page 8).

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



metric units

Elesa Standards		Main dimensions						Tightening torque	Δ
Code	Description	d	h	s	L	M	[Nm]	g	
58284	TN.10x1.5	M10x1.5	9	19	16	15	4÷5	4	
58285	TN.12x1.5	M12x1.5	9	19	16	15	6÷8	4	
58286	TN.14x1.5	M14x1.5	9	19	16	15	6÷8	5	
58287	TN.16x1.5	M16x1.5	9	22	16	17	8÷10	7	
58288	TN.18x1.5	M18x1.5	11	26	18	20.5	8÷10	8	
58289	TN.20x1.5	M20x1.5	11	26	18	20.5	8÷10	8	
58290	TN.22x1.5	M22x1.5	12	32	20	25	10÷12	12	
58291	TN.25x1.5	M25x1.5	12	32	20	25	10÷12	12	
58292	TN.26x1.5	M26x1.5	12	32	20	25	10÷12	14	
58293	TN.35x1.5	M35x1.5	13	38	22	31	15÷18	15	
58401	TN.40x1.5	M40x1.5	14	46	24	38	15÷18	20	
Code	Description	d	h	s	L	M	[Nm]	g	
58294	TN. 1/8	G 1/8	9	19	16	15	4÷6	4	
58295	TN. 1/4	G 1/4	9	19	16	15	4÷6	4	
58296	TN. 3/8	G 3/8	9	22	16	17	8÷10	5	
58297	TN. 1/2	G 1/2	11	26	18	20.5	8÷10	8	
58298	TN. 3/4	G 3/4	12	32	20	25	10÷12	14	
58299	TN. 1	G 1	13	38	22	31	12÷15	18	
58411	TN. 1¼	G 1¼	14	46	24	38	15÷18	20	
58413	TN. 1½	G 1½	15	55	26	46	15÷18	24	



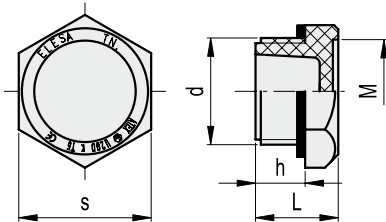
Plugs



- **Material**
Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **ATEX directive compliance**
The plugs of the TN-EX series comply with Health and Safety Requirements intended in 94/9/EC ATEX European Directive (explosive atmospheres) for equipments in Group II, category 2GD. Plugs have “k” protection degree and can therefore be mounted in equipments protected by means of “immersion in liquid”, without lowering protection degree.
II 2 G D k T5, marked on the TN-EX plugs, represents the identification according to ATEX directive.
II: group of substances for which the product is suitable
2: identification of the category
G: identification of the type of explosive atmosphere (Gases or vapours)
D: identification of the type of explosive atmosphere (Dust)
k: protection degree by means of immersion in liquid (kX only for TN.3/4)
T5: temperature class
Ambient and/or fluid temperature: -30 ÷ +100°C
The declaration of conformity to European Directives of this product is available and it is part of the product itself.



Technical data
The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



metric units

Elesa Standards		Main dimensions					Tightening torque	ΔΔ
Code	Description	d	h	s	L	M	[Nm]	g
58296-EX	TN.3/8-EX	G 3/8	9	22	16	17	8+10	5
58297-EX	TN.1/2-EX	G 1/2	11	26	18	20.5	8+10	8
58298-EX	TN.3/4-EX	G 3/4	12	32	20	25	10+12	14

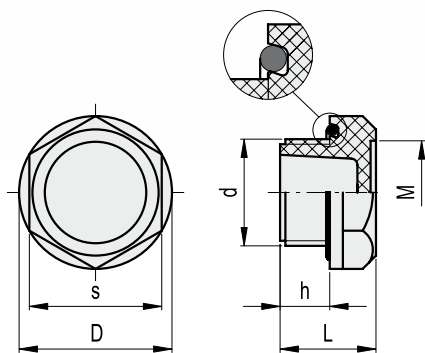
Plugs



- **Material**
Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Packing ring**
NBR synthetic rubber O-Ring.
- **Maximum continuous working temperature**
100°C.

Accessories on request

TNR. plugs are suitable for mounting aluminium plates with graphic symbols MH. (see page 8).



metric units

Elesa Standards		Main dimensions							Tightening torque	
Code	Description	d	h	D	s	L	M		[Nm]	g
158295	TNR.1/4	G 1/4	9	22	19	17	15		4+6	4
158296	TNR.3/8	G 3/8	9	25.5	22	18	17		8+10	6
158297	TNR.1/2	G 1/2	11	32	27	20	20.5		8+10	8
158298	TNR.3/4	G 3/4	12	37	32	22	25		10+12	14
158299	TNR.1	G 1	13	44	38	23	31		12+15	18
158411	TNR. 1¼	G 1¼	14	53.5	46	26	38		15+18	32
158413	TNR.1½	G 1½	15	63.5	55	28	46		15+18	51

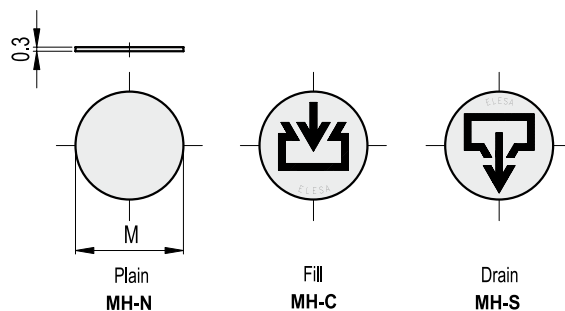
Plates with graphic symbols for oil plugs



- **Material**
Matte anodised aluminium with self-adhesive back for sticking to the plain surface of the plug head.
- **Standardized graphic symbols**
 - **MH-N**: plain surface, without symbols.
 - **MH-C**: with graphic symbol "fill" according to DIN regulations.
 - **MH-S**: with graphic symbol "drain" according to DIN regulations.
- **Maximum continuous working temperature**
100°C.

Applications

The plates with graphic symbols for oil plugs are suitable for the application on plugs type TN. (see page 6), TN-EX (see page 7), TNR. (see page 8), TCD. (see page 9) and TSD. (see page 13).



metric units

Neutral label		Fill label		Drain label		M *
Code	Description	Code	Description	Code	Description	Ø
39501	MH.19-N	39521	MH.19-C	39541	MH.19-S	15
39503	MH.22-N	39523	MH.22-C	39543	MH.22-S	17
39505	MH.26-N	39525	MH.26-C	39545	MH.26-S	20.5
39507	MH.32-N	39527	MH.32-C	39547	MH.32-S	25
39509	MH.38-N	39529	MH.38-C	39549	MH.38-S	31

M * = diameter of the seat of the correspondent plug.

Oil fill plugs



- **Material**
Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Standard executions**
 - **TCD.**: without side hole.
 - **TCDF.**: DIA= 0.08 (2 mm) with side breather hole.
- **Maximum continuous working temperature**
212°F (100°C).
- **Graphic symbol “fill”**
According to DIN regulations.

Accessories on request

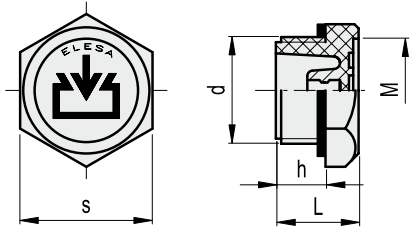
TCD. and TCDF oil fill plugs are suitable for mounting aluminium plates with graphic symbols type MH. (see page 8).

Technical data

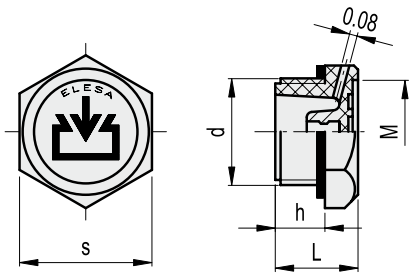
The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



TCD with NPT threads.



TCDF with NPT threads



TCD.

american units

Elesa Standards		Main dimensions					Tightening torque	ΔΔ
Code	Description	d	h	s	L	M	[ft·lb]	lbs
958601	TCD. 1/4 NPT	1/4 NPT	0.35	0.75	0.63	0.59	3+4	0.009
958611	TCD. 3/8 NPT	3/8 NPT	0.35	0.87	0.63	0.67	6+7	0.013
958621	TCD. 1/2 NPT	1/2 NPT	0.43	1.02	0.71	0.81	6+7	0.018
958631	TCD. 3/4 NPT	3/4 NPT	0.47	1.26	0.79	0.98	7+9	0.031

TCDF.

american units

Elesa Standards		Main dimensions					Tightening torque	ΔΔ
Code	Description	d	h	s	L	M	[ft·lb]	lbs
958671	TCDF. 1/4 NPT	1/4 NPT	0.35	0.75	0.63	0.59	3+4	0.009
958673	TCDF. 3/8 NPT	3/8 NPT	0.35	0.87	0.63	0.67	6+7	0.013
958675	TCDF. 1/2 NPT	1/2 NPT	0.43	1.02	0.71	0.81	6+7	0.018
958677	TCDF. 3/4 NPT	3/4 NPT	0.47	1.26	0.79	0.98	7+9	0.031

Oil fill plugs



• Material

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• Colour

Black, matte finish.

• Flat packing ring

NBR synthetic rubber.

• Standard executions

- TCD.: without side hole.

- TCDF.: with side breather hole.

• Maximum continuous working temperature

100°C.

• Graphic symbol "fill"

According to DIN regulations.

Accessories on request

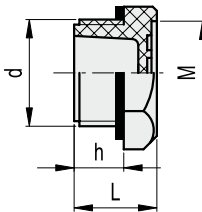
TCD. oil fill plugs are suitable for mounting aluminium plates with graphic symbols type MH. (see page 8).

Technical data

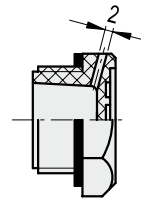
The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



TCD.



TCDF.



TCD.

metric units

Elesa Standards		Main dimensions					Tightening torque	
Code	Description	d	h	s	L	M	[Nm]	g
58551	TCD.10x1.5	M10x1.5	9	19	16	15	4+5	4
58553	TCD.12x1.5	M12x1.5	9	19	16	15	6+8	4
58555	TCD.14x1.5	M14x1.5	9	19	16	15	6+8	5
58557	TCD.16x1.5	M16x1.5	9	22	16	17	8+10	7
58559	TCD.18x1.5	M18x1.5	11	26	18	20.5	8+10	8
58561	TCD.20x1.5	M20x1.5	11	26	18	20.5	8+10	8
58563	TCD.22x1.5	M22x1.5	12	32	20	25	10+12	12
58565	TCD.25x1.5	M25x1.5	12	32	20	25	10+12	12
58569	TCD.26x1.5	M26x1.5	12	32	20	25	10+12	14
58567	TCD.35x1.5	M35x1.5	13	38	22	31	15+18	15
58571	TCD.40x1.5	M40x1.5	14	46	24	38	15+18	20
58591	TCD.1/8	G 1/8	9	19	16	15	4+6	4
58601	TCD.1/4	G 1/4	9	19	16	15	4+6	4
58611	TCD.3/8	G 3/8	9	22	16	17	8+10	5
58621	TCD.1/2	G 1/2	11	26	18	20.5	8+10	8
58631	TCD.3/4	G 3/4	12	32	20	25	10+12	14
58641	TCD.1	G 1	13	38	22	31	12+15	18
58643	TCD.1¼	G 1¼	14	46	24	38	15+18	20
58645	TCD.1½	G 1½	15	55	26	46	15+18	24

TCDF.

metric units

Elesa Standards		Main dimensions					Tightening torque	
Code	Description	d	h	s	L	M	[Nm]	g
58651	TCDF.10x1.5	M10x1.5	9	19	16	15	4+5	4
58653	TCDF.12x1.5	M12x1.5	9	19	16	15	6+8	4
58655	TCDF.14x1.5	M14x1.5	9	19	16	15	6+8	5
58657	TCDF.16x1.5	M16x1.5	9	22	16	17	8+10	7
58659	TCDF.18x1.5	M18x1.5	11	26	18	20.5	8+10	8
58661	TCDF.20x1.5	M20x1.5	11	26	18	20.5	8+10	8
58663	TCDF.22x1.5	M22x1.5	12	32	20	25	10+12	12
58665	TCDF.25x1.5	M25x1.5	12	32	20	25	10+12	12
58681	TCDF.26x1.5	M26x1.5	12	32	20	25	10+12	14
58667	TCDF.35x1.5	M35x1.5	13	38	22	31	15+18	15
58683	TCDF.40x1.5	M40x1.5	14	46	24	38	15+18	20
58669	TCDF.1/8	G 1/8	9	19	16	15	4+6	4
58671	TCDF.1/4	G 1/4	9	19	16	15	4+6	4
58673	TCDF.3/8	G 3/8	9	22	16	17	8+10	5
58675	TCDF.1/2	G 1/2	11	26	18	20.5	8+10	8
58677	TCDF.3/4	G 3/4	12	32	20	25	10+12	14
58679	TCDF.1	G 1	13	38	22	31	12+15	18
58685	TCDF.1¼	G 1¼	14	46	24	38	15+18	20
58687	TCDF.1½	G 1½	15	55	26	46	15+18	24

Oil fill plugs with dipstick



• Material

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• Colour

Black, matte finish.

• Flat packing ring

NBR synthetic rubber.

• Flat dipstick

Flat section phosphatised steel.

On request dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.

• Standard executions

- TCD+a: without side hole.

- TCDF+a: DIA=0.08 (2 mm) with side breather hole.

• Maximum continuous working temperature

212°F (100°C).

• Graphic symbol "fill"

According to DIN regulations.

Accessories on request

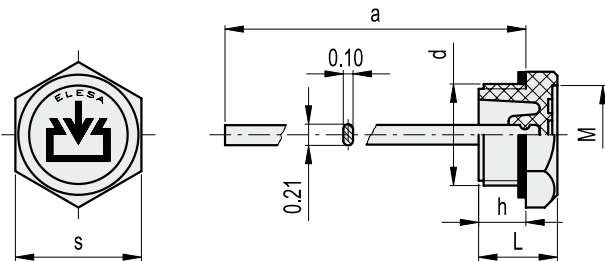
TCD+a and TCDF+a oil fill plugs are suitable for mounting aluminium plates with graphic symbols type MH. (see page 8).

Technical data

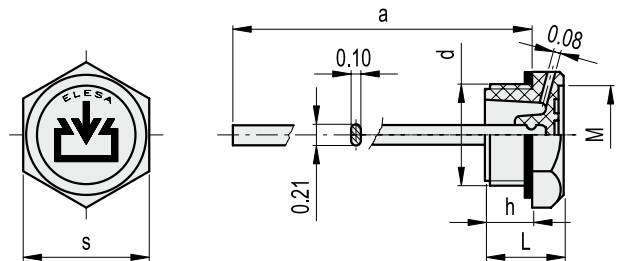
The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



TCD+a



TCDF+a



TCD+a

american units

Elesa Standards		Main dimensions						Tightening torque
Code	Description	d	h	s	L	M	a	[ft·lb]
958601-L*	TCD. 1/4 NPT+a-L*	1/4 NPT	0.35	0.75	0.63	0.59	L*	3+4
958611-L*	TCD. 3/8 NPT+a-L*	3/8 NPT	0.35	0.87	0.63	0.67	L*	6+7
958621-L*	TCD. 1/2 NPT+a-L*	1/2 NPT	0.43	1.02	0.71	0.81	L*	6+7
958631-L*	TCD. 3/4 NPT+a-L*	3/4 NPT	0.47	1.26	0.79	0.98	L*	7+9

TCDF+a

american units

Elesa Standards		Main dimensions						Tightening torque
Code	Description	d	h	s	L	M	a	[ft·lb]
958673-L*	TCDF. 3/8 NPT+a-L*	3/8 NPT	0.35	0.87	0.63	0.67	L*	6+7
958675-L*	TCDF. 1/2 NPT+a-L*	1/2 NPT	0.43	1.02	0.71	0.81	L*	6+7
958677-L*	TCDF. 3/4 NPT+a-L*	3/4 NPT	0.47	1.26	0.79	0.98	L*	7+9

* Complete the code and the description of the standard item needed by adding the dipstick length on request (L*).

Oil fill plugs with flat dipstick



• Material

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• Colour

Black, matte finish.

• Flat packing ring

NBR synthetic rubber.

• Flat dipstick

Flat section phosphatised steel.

On request dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.

• Standard executions

- **TCD+a**: without side hole.

- **TCDF+a**: with side breather hole.

• Maximum continuous working temperature

100°C.

• Graphic symbol "fill"

According to DIN regulations.

Accessories on request

TCDF+a oil fill plugs are suitable for mounting aluminium plates with graphic symbols type MH. (see page 8).

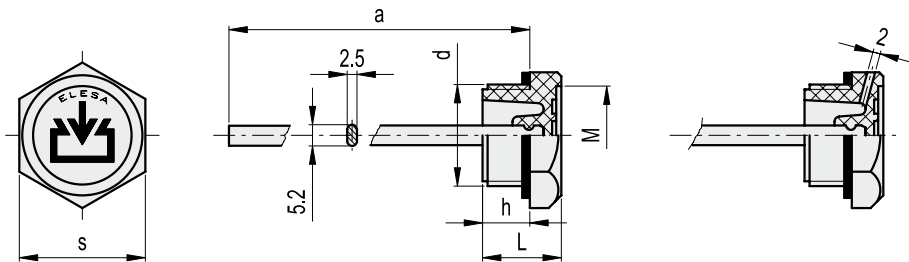
Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



TCD+a

TCDF+a



TCD+a

metric units

Elesa Standards		Main dimensions						Tightening torque	⚙️
Code	Description	d	h	s	L	M	a	[Nm]	g
59501	TCD.10x1.5+a	M10x1.5	9	19	16	15	120	4÷5	21
59503	TCD.12x1.5+a	M12x1.5	9	19	16	15	120	6÷8	21
59505	TCD.14x1.5+a	M14x1.5	9	19	16	15	120	6÷8	22
59507	TCD.16x1.5+a	M16x1.5	9	22	16	17	120	8÷10	22
59509	TCD.18x1.5+a	M18x1.5	11	26	18	20.5	195	8÷10	36
59511	TCD.20x1.5+a	M20x1.5	11	26	18	20.5	195	8÷10	37
59513	TCD.22x1.5+a	M22x1.5	12	32	20	25	195	10÷12	40
59515	TCD.25x1.5+a	M25x1.5	12	32	20	25	195	10÷12	40
59517	TCD.26x1.5+a	M26x1.5	12	32	20	25	195	10÷12	42
59519	TCD.35x1.5+a	M35x1.5	13	38	22	31	195	15÷18	44
59523	TCD.40x1.5+a	M40x1.5	14	46	24	38	195	15÷18	49
59531	TCD.1/8+a	G 1/8	9	19	16	15	120	4÷6	22
59533	TCD.1/4+a	G 1/4	9	19	16	15	120	4÷6	22
59535	TCD.3/8+a	G 3/8	9	22	16	17	120	8÷10	22
59537	TCD.1/2+a	G 1/2	11	26	18	20.5	195	8÷10	37
59539	TCD.3/4+a	G 3/4	12	32	20	25	195	10÷12	40
59541	TCD.1+a	G 1	13	38	22	31	195	12÷15	44
59543	TCD.1¼+a	G 1¼	14	46	24	38	195	15÷18	49
59545	TCD.1½+a	G 1½	15	55	26	46	195	15÷18	53

TCDF+a

metric units

Elesa Standards		Main dimensions						Tightening torque	⚙️
Code	Description	d	h	s	L	M	a	[Nm]	g
59557	TCDF.16x1.5+a	M16x1.5	9	22	16	17	120	8÷10	15
59559	TCDF.18x1.5+a	M18x1.5	11	26	18	20.5	195	8÷10	30
59561	TCDF.20x1.5+a	M20x1.5	11	26	18	20.5	195	8÷10	30
59563	TCDF.22x1.5+a	M22x1.5	12	32	20	25	195	10÷12	35
59565	TCDF.25x1.5+a	M25x1.5	12	32	20	25	195	10÷12	35
59567	TCDF.26x1.5+a	M26x1.5	12	32	20	25	195	10÷12	35
59569	TCDF.35x1.5+a	M35x1.5	13	38	22	31	195	15÷18	40
59573	TCDF.40x1.5+a	M40x1.5	14	46	24	38	195	15÷18	49
59585	TCDF.3/8+a	G 3/8	9	22	16	17	120	8÷10	20
59587	TCDF.1/2+a	G 1/2	11	26	18	20.5	195	8÷10	30
59589	TCDF.3/4+a	G 3/4	12	32	20	25	195	10÷12	35
59591	TCDF.1+a	G 1	13	38	22	31	195	12÷15	45
59595	TCDF.1¼+a	G 1¼	14	46	24	38	195	15÷18	49
59597	TCDF.1½+a	G 1½	15	55	26	46	195	15÷18	53

Oil drain plugs



• Material

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• Colour

Red similar to RAL 3000, matte finish.

• Flat packing ring

NBR synthetic rubber.

• Maximum continuous working temperature

212°F (100°C).

• Graphic symbol “drain”

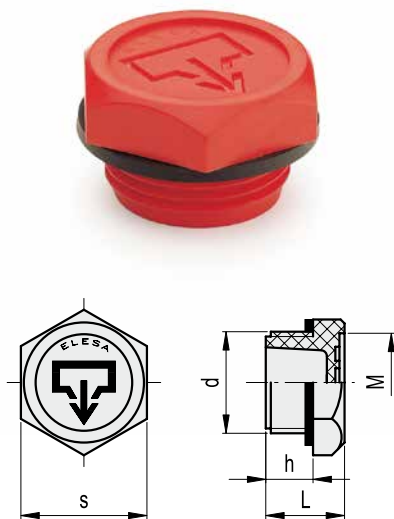
According to DIN regulations.

Accessories on request

TSD. plugs are suitable for mounting aluminium plates with graphic symbols type MH. (see page 8).

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



american units

Elesa Standards		Main dimensions						Tightening torque	⚠
Code	Description	d	h	s	L	M		[ft·lb]	lbs
959974	TSD.1/4 NPT	1/4 NPT	0.35	0.75	0.63	0.59		3÷4	0.009
959976	TSD.3/8 NPT	3/8 NPT	0.35	0.87	0.63	0.67		6÷7	0.011
959978	TSD.1/2 NPT	1/2 NPT	0.43	1.02	0.71	0.81		6÷7	0.018
959980	TSD.3/4 NPT	3/4 NPT	0.47	1.26	0.79	0.98		7÷9	0.031

Oil drain plugs



• Material

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• Colour

Red similar to RAL 3000, matte finish.

• Flat packing ring

NBR synthetic rubber.

• Maximum continuous working temperature

100°C.

• Graphic symbol “drain”

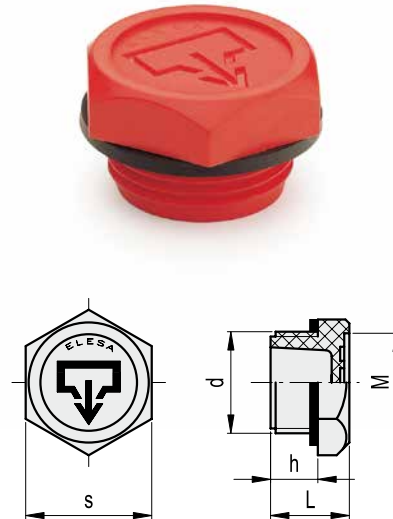
According to DIN regulations.

Accessories on request

TSD. plugs are suitable for mounting aluminium plates with graphic symbols type MH. (see page 8).

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



metric units

Elesa Standards		Main dimensions						Tightening torque	⚠
Code	Description	d	h	s	L	M		[Nm]	g
59942	TSD.10x1.5	M10x1.5	9	19	16	15		4÷5	4
59944	TSD.12x1.5	M12x1.5	9	19	16	15		6÷8	4
59946	TSD.14x1.5	M14x1.5	9	19	16	15		6÷8	5
59948	TSD.16x1.5	M16x1.5	9	22	16	17		8÷10	7
59950	TSD.18x1.5	M18x1.5	11	26	18	20.5		8÷10	8
59952	TSD.20x1.5	M20x1.5	11	26	18	20.5		8÷10	8
59954	TSD.22x1.5	M22x1.5	12	32	20	25		10÷12	12
59956	TSD.25x1.5	M25x1.5	12	32	20	25		10÷12	12
59958	TSD.26x1.5	M26x1.5	12	32	20	25		10÷12	14
59960	TSD.35x1.5	M35x1.5	13	38	22	31		15÷18	15
59964	TSD.40x1.5	M40x1.5	14	46	24	38		15÷18	20
59972	TSD.1/8	G 1/8	9	19	16	15		4÷6	4
59974	TSD.1/4	G 1/4	9	19	16	15		4÷6	4
59976	TSD.3/8	G 3/8	9	22	16	17		8÷10	5
59978	TSD.1/2	G 1/2	11	26	18	20.5		8÷10	8
59980	TSD.3/4	G 3/4	12	32	20	25		10÷12	14
59982	TSD.1	G 1	13	38	22	31		15÷18	18
59986	TSD.1¼	G 1¼	14	46	24	38		15÷18	20
59988	TSD.1½	G 1½	15	55	26	46		15÷18	24

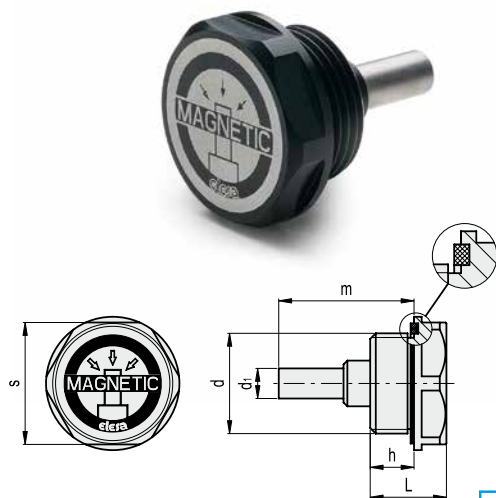
Magnetic plugs



- **Material**
Black anodised aluminium.
Marked "MAGNETIC" and graphic symbol, laser engraved.
- **Permanent magnetic element**
(AlNiCo) Aluminium-nickel-cobalt with a high attractive power, to keep metal particles in oil.
- **Standard executions**
 - **TMB:** NBR synthetic rubber flat packing ring.
Max working temperature 100°C.
 - **TMB-HT:** FKM synthetic rubber flat packing ring.
Max working temperature 180°C.

Technical data

The positioning of the packing ring in its housing guarantees a high tightening torque, therefore the plug can be used even in pressurised reservoirs.



TMB

metric units

Elesa Standards		Main dimensions							△△
Code	Description	d	h	s	L	d1	m	g	
59701	TMB.M14x1,5	M14x1.5	9	19	16.5	6	30	14	
59703	TMB.M16x1,5	M16x1.5	9	22	16.5	8	31	22	
59705	TMB.M20x1,5	M20x1.5	11	24	18.5	8	34	28	
59707	TMB.M26x1,5	M26x1.5	11.5	32	20	8	35.5	45	
59709	TMB.M27x1,5	M27x1.5	11.5	32	20	8	35.5	46	
59711	TMB.M33x1,5	M33x1.5	11.5	38	20	8	35.5	65	
59713	TMB.M40x1,5	M40x1.5	13	46	24	8	37	107	
59715	TMB.M42x1,5	M42x1.5	13	46	24	8	37	110	
59717	TMB.M42x2	M42x2	13	46	24	8	37	113	
59721	TMB.1/4	G 1/4	9	19	16.5	6	30	14	
59723	TMB.3/8	G 3/8	9	22	16.5	8	31	22	
59725	TMB.1/2	G 1/2	11	24	18.5	8	34	28	
59727	TMB.3/4	G 3/4	11.5	32	20	8	35.5	45	
59729	TMB.1	G 1	11.5	38	20	8	35.5	65	
59731	TMB.1¼	G 1 ¼	13	46	24	8	37	107	
59733	TMB.1½	G 1 ½	13	50	24	8	37	131	

TMB-HT

59751	TMB-HT.M14x1,5	M14x1.5	9	19	16.5	6	30	14	
59753	TMB-HT.M16x1,5	M16x1.5	9	22	16.5	8	31	22	
59755	TMB-HT.M20x1,5	M20x1.5	11	24	18.5	8	34	28	
59757	TMB-HT.M26x1,5	M26x1.5	11.5	32	20	8	35.5	45	
59759	TMB-HT.M27x1,5	M27x1.5	11.5	32	20	8	35.5	46	
59761	TMB-HT.M33x1,5	M33x1.5	11.5	38	20	8	35.5	65	
59763	TMB-HT.M40x1,5	M40x1.5	13	46	24	8	37	107	
59765	TMB-HT.M42x1,5	M42x1.5	13	46	24	8	37	110	
59767	TMB-HT.M42x2	M42x2	13	46	24	8	37	113	
59771	TMB-HT.1/4	G 1/4	9	19	16.5	6	30	14	
59773	TMB-HT.3/8	G 3/8	9	22	16.5	8	31	22	
59775	TMB-HT.1/2	G 1/2	11	24	18.5	8	34	28	
59777	TMB-HT.3/4	G 3/4	11.5	32	20	8	35.5	45	
59779	TMB-HT.1	G 1	11.5	38	20	8	35.5	65	
59781	TMB-HT.1¼	G 1 ¼	13	46	24	8	37	107	
59783	TMB-HT.1½	G 1 ½	13	50	24	8	37	131	

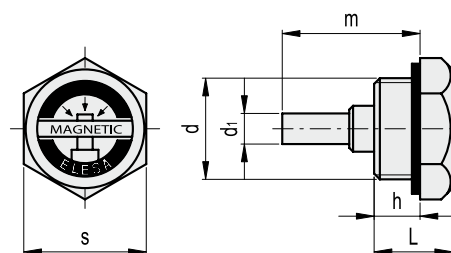
Magnetic plugs



- **Material**
Aluminium.
- **Plate**
Matte anodised aluminium marked "MAGNETIC" and graphic symbol.
- **Flat packing ring**
NBR synthetic rubber.
- **Permanent magnetic element**
(AlNiCo) Aluminium-nickel-cobalt with a high attractive power, to keep metal particles in oil.
- **Maximum continuous working temperature**
100°C.

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.



metric units

Elesa Standards		Main dimensions							Tightening torque	△△
Code	Description	d	h	s	L	d1	m		[Nm]	g
59791	TMA.1/4	G 1/4	9	19	15.5	6	30		8÷10	15
59801	TMA.3/8	G 3/8	9	22	15.5	8	30.5		8÷10	22
59811	TMA.1/2	G 1/2	11	26	18	8	34		10÷15	30
59821	TMA.3/4	G 3/4	12	32	20	8	36		10÷15	44

Plugs

- **Material**
Aluminium, sandblasted matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Standard execution**
GN 741-OS: neutral plug with no symbols.
- **Maximum continuous working temperature**
100°C.

Special executions on request

- GN 741-ES: plugs with laser engraved graphic symbol "fill", according to DIN regulations.
- GN 741-AS: plugs with laser engraved graphic symbol "drain", according to DIN regulations.
- Plugs with Ø 2 mm side breather hole.

Features

GN 741 plugs are provided with a threaded blind hole for assembling a dipstick.



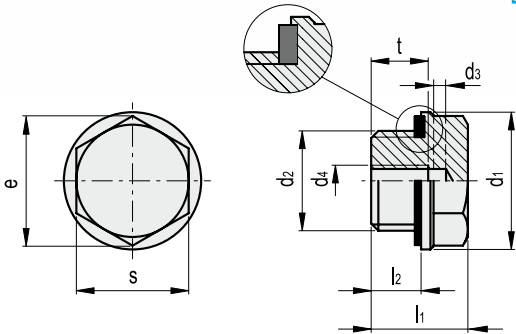
GN 741-ES



GN 741-AS



Conversion Table	
1 mm = 0.039 inch	
d1	
mm	inch
19	0.75
22	0.87
26	1.02
32	1.26
40	1.57
50	1.97
60	2.36



metric units

Elesa-Gantergriff		Main dimensions										Δ
Code	Description	d1	d2	d3	d4	l1	l2	t	s	e	g	
GN.37810	GN 741-19-M14x1.5-OS-1	19	M14x1.5	2	M5	15.5	8	8	15	17.3	7	
GN.37811	GN 741-22-M16x1.5-OS-1	22	M16x1.5	2	M5	15.5	8	8	15	20.8	10	
GN.37813	GN 741-26-M20x1.5-OS-1	26	M20x1.5	2	M5	16	8.5	8	21	24.3	15	
GN.37816	GN 741-32-M26x1.5-OS-1	32	M26x1.5	2	M5	17	9	8	27	31.2	26	
GN.37817	GN 741-40-M33x1.5-OS-1	40	M33x1.5	2	M5	19.5	11	8	32	37	47	
GN.37818	GN 741-50-M42x2-OS-1	50	M42x2	2	M5	21	12	8	41	47.3	75	
GN.37820	GN 741-19-G1/4-OS-1	19	G1/4	2	M5	15.5	8	8	15	17.3	7	
GN.37821	GN 741-22-G3/8-OS-1	22	G3/8	2	M5	15.5	8	8	18	20.8	10	
GN.37822	GN 741-26-G1/2-OS-1	26	G1/2	2	M5	16	8.5	8	21	24.3	15	
GN.37823	GN 741-32-G3/4-OS-1	32	G3/4	8	M5	17	9	8	27	31.2	26	
GN.37824	GN 741-40-G1-OS-1	40	G1	2	M5	19.5	11	8	32	37	50	
GN.37825	GN 741-50-G1 1/4-OS-1	50	G1 1/4	2	M5	21	12	8	41	47.3	60	
GN.37826	GN 741-60-G1 1/2-OS-1	60	G1 1/2	2	M5	22	13	8	50	57.7	120	

Plugs for application with high temperatures

- **Material**
Aluminium, sandblasted matte finish.
- **Flat packing ring**
FKM type VITON®.
- **Standard execution**
GN 742-OS: neutral plug with no symbols.
- **Maximum continuous working temperature**
180°C.

Special executions on request

- GN 742-ES: plugs with laser engraved graphic symbol "fill", according to DIN regulations.
- GN 742-AS: plugs with laser engraved graphic symbol "drain", according to DIN regulations.
- Plugs with Ø 2 mm side breather hole.

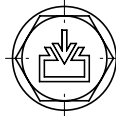
Features

GN 742 plugs are provided with a threaded blind hole for assembling a dipstick.

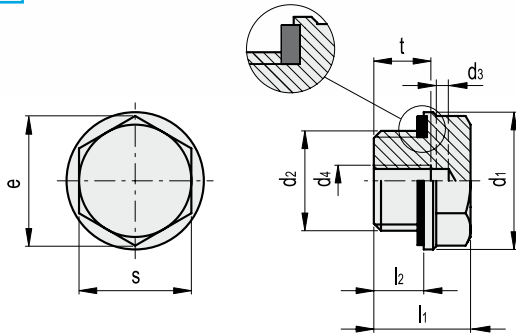
* Registered trademark by DuPont Dow Elastomers.



GN 742-ES



GN 742-AS



metric units

Elesa-Gantergriff		Main dimensions										Δ
Code	Description	d1	d2	d3	d4	l1	l2	t	s	e	g	
GN.37870	GN 742 -19-M14x1.5-OS-1	19	M14x1.5	2	M5	15.5	8	8	15	17.3	7	
GN.37871	GN 742-22-M16x1.5-OS-1	22	M16x1.5	2	M5	15.5	8	8	18	20.8	10	
GN.37873	GN 742-26-M20x1.5-OS-1	26	M20x1.5	2	M5	16	8.5	8	21	24.3	15	
GN.37876	GN 742-32-M26x1.5-OS-1	32	M26x1.5	2	M5	17	9	8	27	31.2	26	
GN.37877	GN 742-40-M33x1.5-OS-1	40	M33x1.5	2	M5	19.5	11	8	32	37	40	
GN.37878	GN 742-50-M42x2-OS-1	50	M42x2	2	M5	21	12	8	41	47.3	55	
GN.37880	GN 742-19-G1/4- OS-1	19	G1/4	2	M5	15.5	8	8	15	17.3	7	
GN.37881	GN 742-22-G3/8-OS-1	22	G 3/8	2	M5	15.5	8	8	18	20.8	10	
GN.37882	GN 742-26-G1/2-OS-1	26	G 1/2	2	M5	16	8.5	8	21	24.3	15	
GN.37883	GN 742-32-G3/4-OS-1	32	G 3/4	2	M5	17	9	8	27	31.2	26	
GN.37884	GN 742-40-G1-OS-1	40	G 1	2	M5	19.5	11	8	32	37	47	
GN.37885	GN 742-50-G1 1/4-OS-1	50	G1 1/4	2	M5	21	12	8	41	47.3	60	
GN.37886	GN 742-60-G1 1/2-OS-1	60	G1 1/2	2	M5	22	13	8	50	57.7	120	

Plugs with hexagon socket• **Material**

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• **Colour**

Black, matte finish.

• **Flat packing ring**

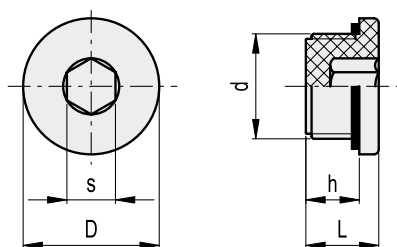
NBR synthetic rubber.

• **Maximum continuous working temperature**

212°F (100°C).

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.

*american units*

Elesa Standards		Main dimensions						Tightening torque	
Code	Description	d	h	s	L	D		[ft·lb]	lbs
961034	TCE.3/8 NPT	3/8 NPT	0.35	0.31	0.51	0.87		2+4	0.011
961035	TCE.1/2 NPT	1/2 NPT	0.43	0.39	0.59	1.1		2+3	0.018
961036	TCE.3/4 NPT	3/4 NPT	0.47	0.47	0.65	1.26		2+4	0.031

Plugs with hexagon socket• **Material**

Glass-fibre reinforced polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

• **Colour**

Black, matte finish.

• **Flat packing ring**

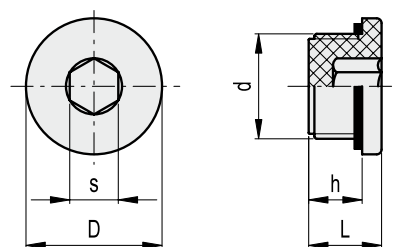
NBR synthetic rubber.

• **Maximum continuous working temperature**

100°C.

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.

*metric units*

Elesa Standards		Main dimensions						Tightening torque	
Code	Description	d	h	s	L	D		[Nm]	g
161033	TCE.1/4	G 1/4	9	6	12	20		3	4
161034	TCE.3/8	G 3/8	9	8	13	22		3+5	5
161035	TCE.1/2	G 1/2	11	10	15	28		3+4	8
161036	TCE.3/4	G 3/4	12	12	16.5	32		3+5	14

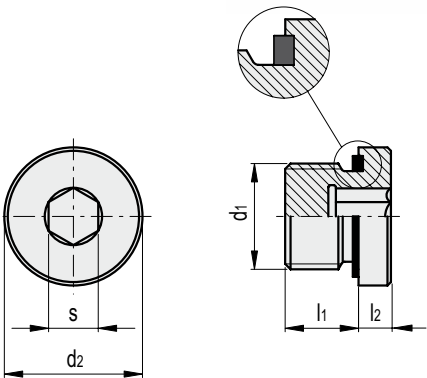
Plugs with hexagon socket for high pressures



- **Material**
Zinc-plated steel (class 5.8 - tensile strength 500 N/mm²). Ultrasonically checked.
- **Flat packing ring**
NBR synthetic rubber.
- **Maximum continuous working temperature**
100°C.
- **Maximum working pressure**
400 bar (250 bar for G1¼).

Special executions on request

- Plugs with metric threads.
 - Packing ring in VITON®* resistant to temperatures up to 200°C (GN 749-B).
- * Registered trademark by DuPont Dow Elastomers.



metric units

Elesa-Gantergriff		Main dimensions					Tightening torque [Nm]	ΔΔ
Code	Description	d1	d2	l1	l2	s		g
GN.37901	GN 749-M8x1-A	M8x1	12	8	4	4	8	5
GN.37903	GN 749-M10x1-A	M10x1	14	8	4	5	12	5
GN.37905	GN 749-M12x1.5-A	M12x1.5	17	12	5	6	25	15
GN.37907	GN 749-M14x1.5-A	M14x1.5	19	12	5	6	30	20
GN.37909	GN 749-M16x1.5-A	M16x1.5	22	12	5	8	50	25
GN.37911	GN 749-M18x1.5-A	M18x1.5	24	12	5	8	60	30
GN.37913	GN 749-M20x1.5-A	M20x1.5	26	14	5	10	70	42
GN.37915	GN 749-M22x1.5-A	M22x1.5	27	14	5	10	80	50
GN.37917	GN 749-M24x1.5-A	M24x1.5	30	14	5	12	95	56
GN.37919	GN 749-M26x1.5-A	M26x1.5	32	16	5	12	120	75
GN.37921	GN 749-M27x2-A	M27x2	32	16	5	12	120	80
GN.37923	GN 749-M30x1.5-A	M30x1.5	37	16	6.5	17	190	103
GN.37925	GN 749-M33x2-A	M33x2	40	16	6.5	17	225	125
GN.37927	GN 749-M42x2-A	M42x2	50	16	6.5	22	360	201
GN.37929	GN 749-M48x2-A	M48x2	55	16	6.5	24	400	254
GN.37931	GN 749-G1/8-A	G1/8	14	8	4	5	12	5
GN.37932	GN 749-G1/4-A	G1/4	19	12	5	6	30	15
GN.37933	GN 749-G3/8-A	G3/8	22	12	5	8	50	25
GN.37934	GN 749-G1/2-A	G1/2	27	14	5	10	80	45
GN.37935	GN 749-G3/4-A	G3/4	32	16	5	12	120	75
GN.37936	GN 749-G1-A	G1	40	16	6.5	17	225	124
GN.37937	GN 749-G1¼-A	G1¼	50	16	6.5	22	360	195
GN.37938	GN 749-G1½-A	G1½	55	16	6.5	24	400	240

Plugs with hexagon socket

RoHS**• Material**

Zinc-plated steel (class 5.8 - tensile strength 500 N/mm²).
Ultrasonically checked.

• Standard versions

- **DIN 908-A**: without packing ring.
- **DIN 908-AC**: with copper flat packing ring.
- **DIN 908-AA**: with aluminium flat packing ring.

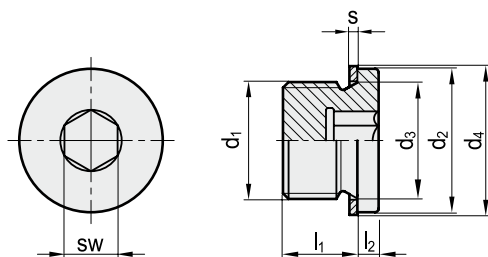
Special executions on request

- Stainless steel executions.

Features and applications

The packing rings in metal, copper or aluminum, allow the use of DIN 908 plugs also on high temperature applications.

Not advisable to use when there is a frequent screwing / unscrewing of the plug, for the possibility of deformation of the metal packing ring.

**DIN 908-A***metric units*

Elesa-Gantergriff		Main dimensions								
Code	Description	d1	d2 h14	d3	d4	l1 ±0.2	l2 ±0.5	s	sw	g
GN.90701	DIN 908-ST-M8x1-A	M8x1	12	8.3	-	8	3	1	4	4
GN.90706	DIN 908-ST-M10x1-A	M10x1	14	10.3	-	8	3	1	5	6
GN.90711	DIN 908-ST-M12x1.5-A	M12x1.5	17	12.3	-	12	3	1.5	6	11
GN.90716	DIN 908-ST-M14x1.5-A	M14x1.5	19	14.3	-	12	3	1.5	6	16
GN.90721	DIN 908-ST-M16x1.5-A	M16x1.5	21	16.3	-	12	3	1.5	8	20
GN.90726	DIN 908-ST-M18x1.5-A	M18x1.5	23	18.3	-	12	4	1.5	8	29
GN.90731	DIN 908-ST-M20x1.5-A	M20x1.5	25	20.3	-	14	4	1.5	10	38
GN.90736	DIN 908-ST-M22x1.5-A	M22x1.5	27	22.3	-	14	4	1.5	10	42
GN.90741	DIN 908-ST-M24x1.5-A	M24x1.5	29	24.3	-	14	4	2	12	53
GN.90746	DIN 908-ST-M26x1.5-A	M26x1.5	31	26.3	-	16	4	2	12	73
GN.90751	DIN 908-ST-M27x2-A	M27x2	32	27.3	-	16	4	2	12	75
GN.90756	DIN 908-ST-M30x1.5-A	M30x1.5	36	30.3	-	16	4	2	17	84
GN.90761	DIN 908-ST-M33x2-A	M33x2	39	33.3	-	16	5	2	17	119
GN.90766	DIN 908-ST-M42x2-A	M42x2	49	42.3	-	16	5	2	22	187
GN.90771	DIN 908-ST-M48x2-A	M48x2	55	48.3	-	16	5	2	24	240
GN.90781	DIN 908-ST-G1/8-A	G1/8	14	10	-	8	3	1	6	6
GN.90786	DIN 908-ST-G1/4-A	G1/4	18	13.4	-	12	3	1.5	6	14
GN.90791	DIN 908-ST-G3/8-A	G3/8	22	17	-	12	3	1.5	8	22
GN.90796	DIN 908-ST-G1/2-A	G1/2	26	21.3	-	14	4	1.5	10	41
GN.90801	DIN 908-ST-G3/4-A	G3/4	32	26.7	-	16	4	2	12	53
GN.90806	DIN 908-ST-G1-A	G1	39	33.5	-	16	5	2	17	119
GN.90811	DIN 908-ST-G1 1/4-A	G1 1/4	49	42.2	-	16	5	2	22	185
GN.90816	DIN 908-ST-G1 1/2-A	G 1 1/2	55	48.1	-	16	5	2	24	237

DIN 908-AC

metric units

Elesa-Gantergriff		Main dimensions								△△
Code	Description	d1	d2 h14	d3	d4	l1 ±0.2	l2 ±0.5	s	sw	g
GN.90703	DIN 908-ST-M8x1-AC	M8x1	12	8.3	11.5	8	3	1	4	5
GN.90708	DIN 908-ST-M10x1-AC	M10x1	14	10.3	13.5	8	3	1	5	7
GN.90713	DIN 908-ST-M12x1.5-AC	M12x1.5	17	12.3	16	12	3	1.5	6	12
GN.90718	DIN 908-ST-M14x1.5-AC	M14x1.5	19	14.3	18	12	3	1.5	6	17
GN.90723	DIN 908-ST-M16x1.5-AC	M16x1.5	21	16.3	20	12	3	1.5	8	21
GN.90728	DIN 908-ST-M18x1.5-AC	M18x1.5	23	18.3	22	12	4	1.5	8	30
GN.90733	DIN 908-ST-M20x1.5-AC	M20x1.5	25	20.3	24	14	4	1.5	10	40
GN.90738	DIN 908-ST-M22x1.5-AC	M22x1.5	27	22.3	27	14	4	1.5	10	44
GN.90743	DIN 908-ST-M24x1.5-AC	M24x1.5	29	24.3	29	14	4	2	12	56
GN.90748	DIN 908-ST-M26x1.5-AC	M26x1.5	31	26.3	31	16	4	2	12	76
GN.90753	DIN 908-ST-M27x2-AC	M27x2	32	27.3	32	16	4	2	12	79
GN.90758	DIN 908-ST-M30x1.5-AC	M30x1.5	36	30.3	36	16	4	2	17	88
GN.90763	DIN 908-ST-M33x2-AC	M33x2	39	33.3	39	16	5	2	17	124
GN.90768	DIN 908-ST-M42x2-AC	M42x2	49	42.3	49	16	5	2	22	194
GN.90773	DIN 908-ST-M48x2-AC	M48x2	55	48.3	55	16	5	2	24	248
GN.90783	DIN 908-ST-G1/8-AC	G1/8	14	10	13.5	8	3	1	6	7
GN.90788	DIN 908-ST-G1/4-AC	G1/4	18	13.4	18	12	3	1.5	6	15
GN.90793	DIN 908-ST-G3/8-AC	G3/8	22	17	21	12	3	1.5	8	24
GN.90798	DIN 908-ST-G1/2-AC	G1/2	26	21.3	26	14	4	1.5	10	43
GN.90803	DIN 908-ST-G3/4-AC	G3/4	32	26.7	32	16	4	2	12	56
GN.90808	DIN 908-ST-G1-AC	G1	39	33.5	39	16	5	2	17	124
GN.90813	DIN 908-ST-G1 1/4-AC	G1 1/4	49	42.2	49	16	5	2	22	192
GN.90818	DIN 908-ST-G1 1/2-AC	G1 1/2	55	48.1	55	16	5	2	24	244

DIN 908-AA

GN.90702	DIN 908-ST-M8x1-AA	M8x1	12	8.3	11.5	8	3	1	4	5
GN.90707	DIN 908-ST-M10x1-AA	M10x1	14	10.3	13.5	8	3	1	5	7
GN.90712	DIN 908-ST-M12x1.5-AA	M12x1.5	17	12.3	16	12	3	1.5	6	12
GN.90717	DIN 908-ST-M14x1.5-AA	M14x1.5	19	14.3	18	12	3	1.5	6	17
GN.90722	DIN 908-ST-M16x1.5-AA	M16x1.5	21	16.3	20	12	3	1.5	8	21
GN.90727	DIN 908-ST-M18x1.5-AA	M18x1.5	23	18.3	22	12	4	1.5	8	30
GN.90732	DIN 908-ST-M20x1.5-AA	M20x1.5	25	20.3	24	14	4	1.5	10	40
GN.90737	DIN 908-ST-M22x1.5-AA	M22x1.5	27	22.3	27	14	4	1.5	10	44
GN.90742	DIN 908-ST-M24x1.5-AA	M24x1.5	29	24.3	29	14	4	2	12	56
GN.90747	DIN 908-ST-M26x1.5-AA	M26x1.5	31	26.3	31	16	4	2	12	76
GN.90752	DIN 908-ST-M27x2-AA	M27x2	32	27.3	32	16	4	2	12	79
GN.90757	DIN 908-ST-M30x1.5-AA	M30x1.5	36	30.3	36	16	4	2	17	88
GN.90762	DIN 908-ST-M33x2-AA	M33x2	39	33.3	39	16	5	2	17	124
GN.90767	DIN 908-ST-M42x2-AA	M42x2	49	42.3	49	16	5	2	22	194
GN.90772	DIN 908-ST-M48x2-AA	M48x2	55	48.3	55	16	5	2	24	248
GN.90782	DIN 908-ST-G1/8-AA	G1/8	14	10	13.5	8	3	1	6	7
GN.90787	DIN 908-ST-G1/4-AA	G1/4	18	13.4	18	12	3	1.5	6	15
GN.90792	DIN 908-ST-G3/8-AA	G3/8	22	17	21	12	3	1.5	8	24
GN.90797	DIN 908-ST-G1/2-AA	G1/2	26	21.3	26	14	4	1.5	10	43
GN.90802	DIN 908-ST-G3/4-AA	G3/4	32	26.7	32	16	4	2	12	56
GN.90807	DIN 908-ST-G1-AA	G1	39	33.5	39	16	5	2	17	124
GN.90812	DIN 908-ST-G1 1/4-AA	G1 1/4	49	42.2	49	16	5	2	22	192
GN.90817	DIN 908-ST-G1 1/2-AA	G1 1/2	55	48.1	55	16	5	2	24	244

Plugs

- **Material**
Aluminium.
- **Flat packing ring**
NBR synthetic rubber.
- **Standard executions**
 - **GN 441-SW**: epoxy resin coating, RAL 9005 black colour, matte finish.
 - **GN 441-BL**: natural aluminium.
- **Maximum continuous working temperature**
100°C.

Features

GN 441 plugs are provided with a threaded blind hole for assembling a dipstick.

Special executions on request

Side breather hole.



Plugs for application with high temperatures

- **Material**
Aluminium.
- **Flat packing ring**
FPM type VITON®*.
- **Standard executions**
 - **GN 442-SW**: epoxy resin coating, RAL 9005 black colour, matte finish.
 - **GN 442-BL**: natural aluminium.
- **Maximum continuous working temperature**
200°C.

Features

GN 442 plugs are provided with a threaded blind hole for assembling a dipstick.

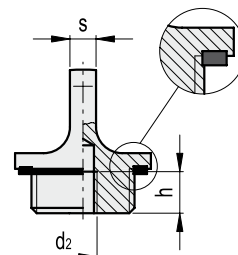
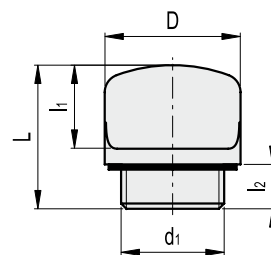
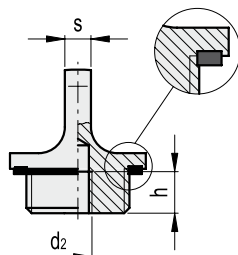
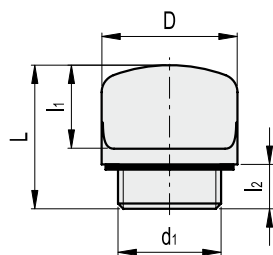
Special executions on request

Side breather hole.

* Registered trademark by DuPont Dow Elastomers.



Conversion Table	
1 mm = 0.039 inch	
d1	
mm	inch
22	0.87
26	1.02
32	1.26
40	1.57



metric units

metric units

Elesa-Gantergriff		Main dimensions									ΔΔ
Code	Description	D	d1	d2	L	l2	l1	s	h	g	
GN.22403	GN 441-22-M16x1.5-1-SW	22	M16x1.5	M5	26	8	15	5	8	12	
GN.22401	GN 441-22-M16x1.5-1-BL	22	M16x1.5	M5	26	8	15	5	8	12	
GN.22413	GN 441-26-M20x1.5-1-SW	26	M20x1.5	M5	27.5	8.5	16	5	8	17	
GN.22411	GN 441-26-M20x1.5-1-BL	26	M20x1.5	M5	27.5	8.5	16	5	8	17	
GN.22423	GN 441-32-M26x1.5-1-SW	32	M26x1.5	M5	29	9	17	6	8	27	
GN.22421	GN 441-32-M26x1.5-1-BL	32	M26x1.5	M5	29	9	17	6	8	27	
GN.22407	GN 441-22-G3/8-1-SW	22	G3/8	M5	26	8	15	5	8	12	
GN.22405	GN 441-22-G3/8-1-BL	22	G3/8	M5	26	8	15	5	8	12	
GN.22417	GN 441-26-G1/2-1-SW	26	G1/2	M5	27.5	8.5	16	5	8	17	
GN.22415	GN 441-26-G1/2-1-BL	26	G1/2	M5	27.5	8.5	16	5	8	17	
GN.22427	GN 441-32-G3/4-1-SW	32	G3/4	M5	29	9	17	6	8	27	
GN.22425	GN 441-32-G3/4-1-BL	32	G3/4	M5	29	9	17	6	8	27	
GN.22437	GN 441-40-G1-1-SW	40	G1	M5	32.5	11	18	7	8	48	
GN.22435	GN 441-40-G1-1-BL	40	G1	M5	32.5	11	18	7	8	48	

Elesa-Gantergriff		Main dimensions									ΔΔ
Code	Description	D	d1	d2	L	l2	l1	s	h	g	
GN.22453	GN 442-22-M16x1.5-1-SW	22	M16x1.5	M5	26	8	15	5	8	12	
GN.22451	GN 442-22-M16x1.5-1-BL	22	M16x1.5	M5	26	8	15	5	8	12	
GN.22463	GN 442-26-M20x1.5-1-SW	26	M20x1.5	M5	27.5	8.5	16	5	8	17	
GN.22461	GN 442-26-M20x1.5-1-BL	26	M20x1.5	M5	27.5	8.5	16	5	8	17	
GN.22473	GN 442-32-M26x1.5-1-SW	32	M26x1.5	M5	29	9	17	6	8	27	
GN.22471	GN 442-32-M26x1.5-1-BL	32	M26x1.5	M5	29	9	17	6	8	27	
GN.22457	GN 442-22-G3/8-1-SW	22	G3/8	M5	26	8	15	5	8	12	
GN.22455	GN 442-22-G3/8-1-BL	22	G3/8	M5	26	8	15	5	8	12	
GN.22467	GN 442-26-G1/2-1-SW	26	G1/2	M5	27.5	8.5	16	5	8	17	
GN.22465	GN 442-26-G1/2-1-BL	26	G1/2	M5	27.5	8.5	16	5	8	17	
GN.22477	GN 442-32-G3/4-1-SW	32	G3/4	M5	29	9	17	6	8	27	
GN.22475	GN 442-32-G3/4-1-BL	32	G3/4	M5	29	9	17	6	8	27	
GN.22487	GN 442-40-G1-1-SW	40	G1	M5	32.5	11	18	7	8	48	
GN.22485	GN 442-40-G1-1-BL	40	G1	M5	32.5	11	18	7	8	48	

Oil fill plugs for push-fit



- **Material**
High-resilience polypropylene based (PP) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Packing rings**
Two NBR synthetic rubber O-rings.
- **Standard executions**
 - **TPC.**: without side hole.
 - **TPCF.**: with side breather hole.
- **Maximum continuous working temperature**
100°C.
- **Graphic symbol “fill”**
According to DIN regulations.

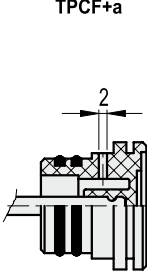
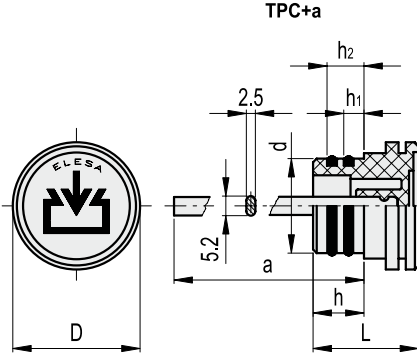
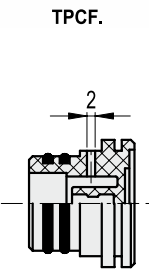
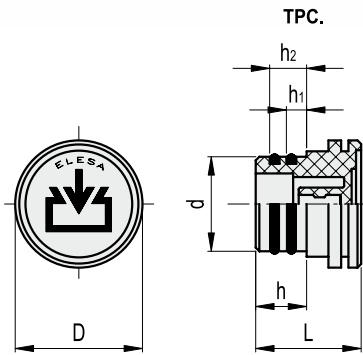
Oil fill plugs with flat dipstick for push-fit



- **Material**
High-resilience polypropylene based (PP) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Packing rings**
Two NBR synthetic rubber O-rings.
- **Flat dipstick**
Flat section phosphatised steel.
On request dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.
- **Standard executions**
 - **TPC+a**: without side hole.
 - **TPCF+a**: with side breather hole.
- **Maximum continuous working temperature**
100°C.
- **Graphic symbol “fill”**
According to DIN regulations.



Conversion Table	
1 mm = 0.039 inch	
d	
mm	inch
20	0.79
26	1.02



TPC.

metric units

Elesa Standards		Main dimensions						Mounting hole	
Code	Description	d	h	D	L	h1	h2	d+0.2	g
59861	TPC.20	20	14	30	29	6.5	10.5	20	8
59881	TPC.26	26	14	35	29.5	6.5	10.5	26	15

TPCF.

59901	TPCF.20	20	14	30	29	6.5	10.5	20	8
59921	TPCF.26	26	14	35	29.5	6.5	10.5	26	15

TPC+a

metric units

Elesa Standards		Main dimensions								Mounting hole	⚖️
Code	Description	d	h	D	L	h1	h2	a	d+0.2	g	
59865	TPC.20+a	20	14	30	29	6.5	10.5	188	20	27	
59885	TPC.26+a	26	14	35	29.5	6.5	10.5	188	26	35	

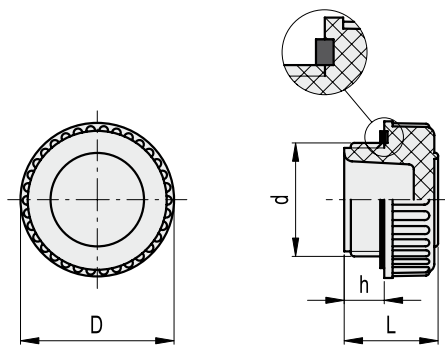
TPCF+a

59905	TPCF.20+a	20	14	30	29	6.5	10.5	188	20	27
59925	TPCF.26+a	26	14	35	29.5	6.5	10.5	188	26	35

Plugs



- **Material**
Phenolic based (PF) Duroplast. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, glossy finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Maximum continuous working temperature**
100°C.



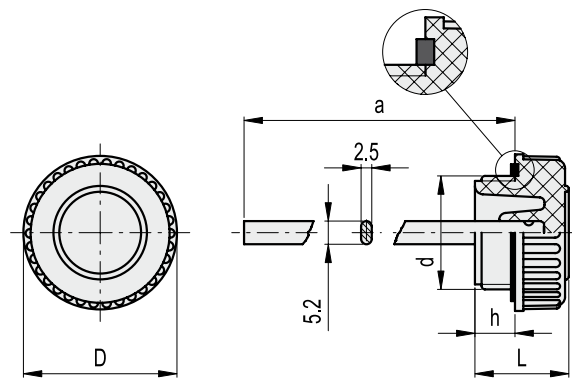
metric units

Elesa Standards		Main dimensions					△△
Code	Description	d	h	D	L	g	
57101	T.240-1/4	G 1/4	8	22	18	6	
57201	T.240-3/8	G 3/8	9	26	21	10	
57301	T.240-1/2	G 1/2	10	32	24	16	
57401	T.240-3/4	G 3/4	10	39	25	23	
57601	T.240-1	G 1	12	45	28	35	
57801	T.240-1¼	G 1¼	12	55	31	60	
57901	T.240-1½	G 1½	12	61	34	80	

Plugs with flat dipstick



- **Material**
Phenolic based (PF) Duroplast. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, glossy finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Flat dipstick**
Flat section phosphatised steel.
On request and for sufficient quantities dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.
- **Maximum continuous working temperature**
100°C.



metric units

Elesa Standards		Main dimensions						△△
Code	Description	d	h	D	L	a	g	
57111	T.240-1/4+a	G 1/4	8	22	18	195	37	
57211	T.240-3/8+a	G 3/8	9	26	21	195	41	
57311	T.240-1/2+a	G 1/2	10	32	24	195	47	
57411	T.240-3/4+a	G 3/4	10	39	25	190	54	
57611	T.240-1+a	G 1	12	45	28	190	66	
57811	T.240-1¼+a	G 1¼	12	55	31	190	91	
57911	T.240-1½+a	G 1½	12	61	34	185	111	

T.440

ELESA Original design

BSP

Plugs



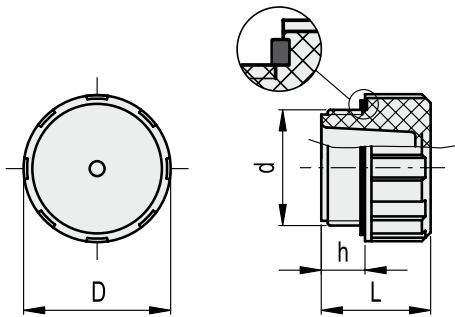
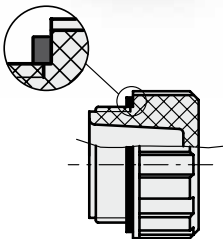
- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Maximum continuous working temperature**
100°C.

Special executions on request

Words, marks and graphic symbols can be tampoprinted on the cap.



T.440-1/4
T.440-3/8



metric units

Elesa Standards		Main dimensions					△△
Code	Description	d	h	D	L	g	
157111	T.440-1/4	G 1/4	9	20.5	19	10	
157121	T.440-3/8	G 3/8	9	25	21	12	
157131	T.440-1/2	G 1/2	11	28.5	25	14	
157141	T.440-3/4	G 3/4	12	34.5	27	22	
157151	T.440-1	G 1	13	42.5	28.5	28	
157161	T.440-1¼	G 1¼	13	52	32	52	
157171	T.440-1½	G 1½	13	57.5	34	63	

T.440+a

ELESA Original design

BSP

Plugs with flat dipstick



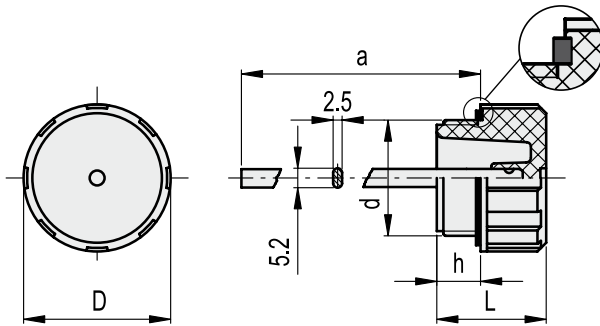
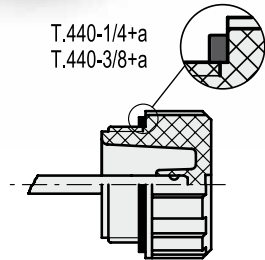
- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Flat dipstick**
Flat section phosphatised steel.
On request dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.
- **Maximum continuous working temperature**
100°C.

Special executions on request

Words, marks and graphic symbols can be tampoprinted on the cap.



T.440-1/4+a
T.440-3/8+a



metric units

Elesa Standards		Main dimensions						△△
Code	Description	d	h	D	L	a	g	
157211	T.440-1/4+a	G 1/4	9	20.5	19	192	30	
157221	T.440-3/8+a	G 3/8	9	25	21	192	32	
157231	T.440-1/2+a	G 1/2	11	28.5	25	189	42	
157241	T.440-3/4+a	G 3/4	12	34.5	27	188	50	
157251	T.440-1+a	G 1	13	42.5	28.5	188	56	
157261	T.440-1¼+a	G 1¼	13	52	32	185	72	
157271	T.440-1½+a	G 1½	13	57.5	34	185	83	

Plugs



- **Material**
Phenolic based (PF) Duroplast. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, glossy finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Maximum continuous working temperature**
100°C.

Plugs



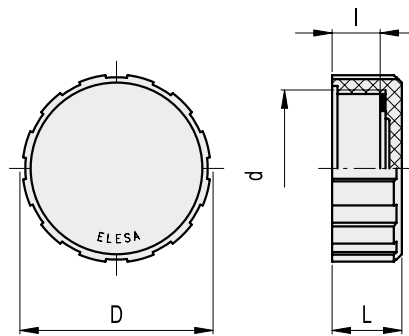
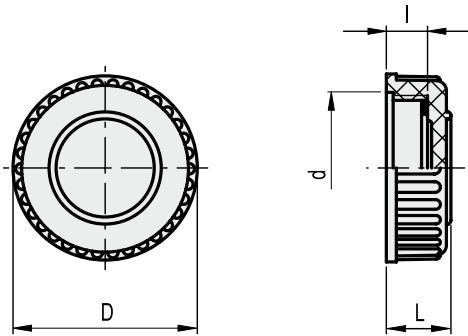
- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Maximum continuous working temperature**
100°C.

Special executions on request

Words, marks and graphic symbols can be tampprinted on the cap.



Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
32	1.26
39	1.54
42	1.65
45	1.77
55	2.17
70	2.76



metric units

Elesa Standards		Main dimensions					△△
Code	Description	d	l	D	L	g	
58001	T.270-1/2	G 1/2	9	32	14	9	
58011	T.270-3/4	G 3/4	10	39	15	15	
58021	T.270-1	G 1	11	45	17	20	
58031	T.270-1¼	G 1¼	12	55	19	42	

metric units

Elesa Standards		Main dimensions					△△
Code	Description	d	l	D	L	g	
58231	T.470-60x2	M60x2	18	70	26	55	
58251	T.470-1	G 1	11	42	16	17	
58281	T.470-2	G 2	18	70	26	58	

Breather caps
with vacuum breaker valve



Material

Polypropylene based (PP) technopolymer.
Resistant to oils, greases and other chemical agents.

- **Cover:** red colour (TVD-EPDM), green (TVD-FKM).

Graphic symbol “valve” tampoprinted in black colour. Avoid contact with solvents, alcohol or detergents containing alcohol to preserve tampoprinted graphic symbol. On request, the cover can be also supplied in black colour, with graphic symbol valve tampoprinted in other colour.

- **Threaded connector:** black colour.

Standard executions

- **TVD-FKM:** flat packing ring and FKM membrane gasket, hardness 70 Shore A.

- **TVD-EPDM:** flat packing ring and EPDM membrane gasket, hardness 70 Shore A.

• **Maximum continuous working temperature**
50°C.

Features and applications

TVD. breather caps with vacuum breaker valve are suitable for reservoirs and tanks for liquid transport. The membrane retaining system allows a quick emptying out of the reservoir by letting in big quantities of air through the cap. Thus avoiding the vacuum inside the reservoir, slowing down the liquid exit. The pre-set pressure of the membrane gasket stops any liquid loss when the reservoir is shaken (for example during transportation). The liquid pressure on the gasket guarantees a perfect seal of the cap, for example in case of overturning of the reservoir.

Resistance to chemical agents

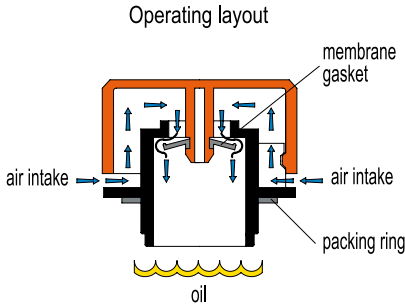
Tests carried out under standard laboratory conditions at 23°C. Values to be considered only as guidelines.

Please contact ELESA Technical Department for further chemical resistance details to particular liquids not reported in the table.

CHEMICAL AGENTS	EPDM	FKM	PP
POOR ACIDS	●	●	●
STRONG ACIDS	●	▲	●
CONC. ACETIC ACID 40%	●	▲	●
CONC. HYDROCHLORIC ACID 10%	●	●	●
CONC. NITRIC ACID 10%	▲	●	■
CONC. SULPHURIC ACID 20%	▲	●	●
ALCOHOL	●	▲	●
ALDEHYDE (FORMALDEHYDE)	●	▲	●
AMMONIA	●	▲	●
POOR BASES	●	●	●
STRONG BASES	●	▲	●
BENZOL	▲	●	▲
KETONES (Acetone, Methyl Ethyl Ketone)	●	▲	●
ESTERS	●	▲	●
GLYCOL	●	●	●
ALIPHATIC HYDROCARBONS (Petrol, Gas oil, Ethane, Propane, Butane)	▲	●	■
AROMATIC HYDROCARBONS (Toluol, Xylol)	▲	●	■
ANIMAL AND VEGETAL OILS AND GRASES	▲	●	●
MINERAL OIL AND GREASES	▲	●	■

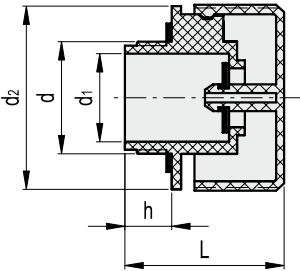
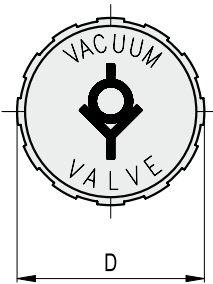
Resistance: Good ● Fair ■ Poor ▲

Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
70	2.76



The membrane gasket warps and lets air inside the reservoir due to the effect of the vacuum which is created by the liquid discharge.

DEPRESSION	FLOW RATE	
	FKM	EPDM
50 mb	360 l/min	370 l/min
40 mb	320 l/min	330 l/min
30 mb	260 l/min	280 l/min
20 mb	210 l/min	230 l/min
10 mb	140 l/min	160 l/min
5 mb	110 l/min	130 l/min



metric units

Elesa Standards		Main dimensions						△
Code	Description	d	D	L	h	d1	d2	g
61011	TVD.70-1¼-FKM	G 1¼	70	59	17	33	68.5	80
61021	TVD.70-1¼-EPDM	G 1¼	70	59	17	33	68.5	80

Breather cap
with sealing closure



- **Material**
 - **Cover:** polyamide based (PA) technopolymer, black colour, semi-matte finish. Resistant to solvents, oils, grases and other chemical agents.
 - **Threaded connector:** acetal based technopolymer (POM), black colour, semi-matte finish.
- **Packing rings**
NBR synthetic rubber O-Ring.
- **Air filter**
Polyurethane foam mesh “tech-foam” (polyester base), air filtration 10 µ.
- **Maximum continuous working temperature**
80°C.

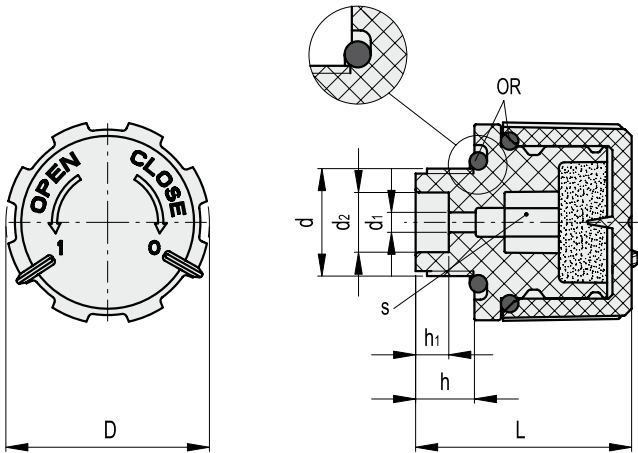
Special executions on request

- Air filter in polyurethane foam mesh “tech-foam” (polyester base) with air filtration 40 µ.
- Cover in RAL 2004 orange.

Features and applications

The cover of the SFC. breather cap (ELESA Patent) can be positioned in two different ways:

- Breather position: air is let in and out of the reservoir in normal conditions of use.
- Closure position: a packing ring between the cover and the threaded connector flange guarantees a perfect sealing of gas or liquid contained in the reservoir.



Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
30	1.18

metric units

Elesa Standards					Main dimensions					
Code	Description	d	h	D	L	d1	d2	h1	s	g
52801	SFC.30-3/8+F	G 3/8	9	30	33	3	9	5	8	18

Assembly instructions

The components are supplied not assembled.

- Screw the threaded connector by means of a hexagon socket, tightening torque 8 Nm (fig. 1).
- Insert the "tech-foam" filter in its proper upper housing.
- Fit the cover on the threaded connector by properly matching the two different teeth (one large and one tight) inside the cover, with the relevant knurlings on the upper part of the threaded connector (fig. 2).
- By turning the cover clockwise of a few degrees the breather position is reached: the index on the cover marked with 1 is in line with the index of the threaded connector (fig. 3).
- By further turning the cover clockwise following the CLOSE arrow, the closure position is reached: the index on the cover marked with 0 is in line with the index of the threaded connector (fig. 4).
- To reach from the closure position to the breather one just turn the cover anticlockwise following the OPEN arrow until the click.
- By further turning the cover anticlockwise following the OPEN arrow, it is possible to remove the cover from the threaded connector, thus allowing the operator to clean the two components or to substitute or clean the "tech-foam" filter (fig. 5).

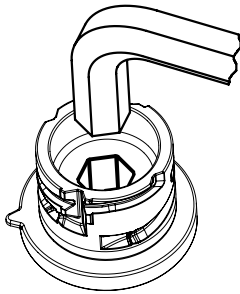
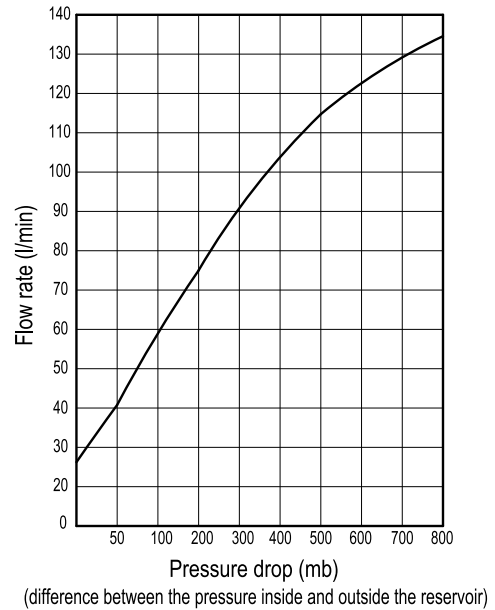


Fig.1

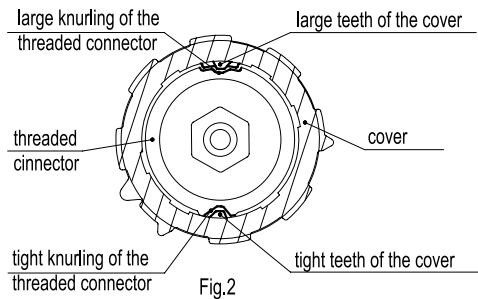


Fig.2

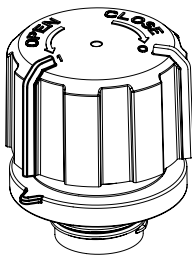


Fig.3

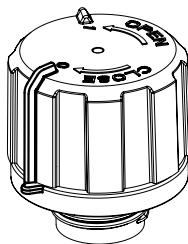


Fig.4

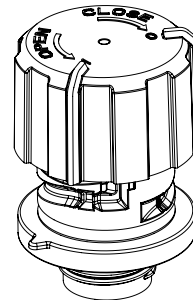


Fig.5

Breather caps



- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
 - **Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".
 - **Threaded connector:** black colour, semi-matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Standard executions**
 - **SFN.:** without air filter.
 - **SFN+F:** with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ.
 - **SFN.70-BA+F:** with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ.
- **Maximum continuous working temperature**
100°C.

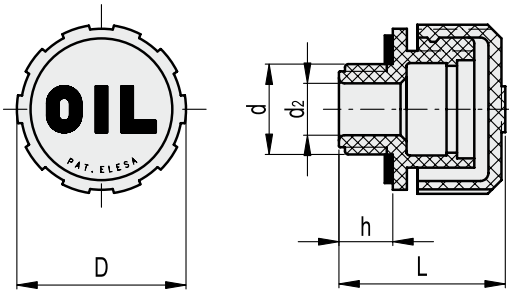
- Special executions on request**
- Cover, RAL 2004 orange, without "OIL" mark.
 - Black cover with or without "OIL" mark.
 - Threaded connector also with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20) for the codes marked with # in the table.

Features and applications
SFN. breather caps, owing to their high air flow rate, are particularly suitable for use on hydraulic power packs or tanks subject to rapid changes in liquid volume.

Technical data
Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.



Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
31	1.22
42	1.65
57	2.24
70	2.76

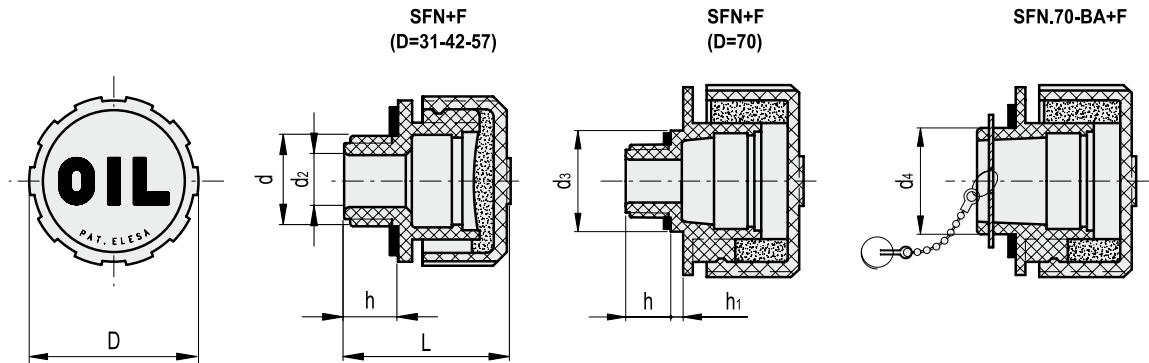
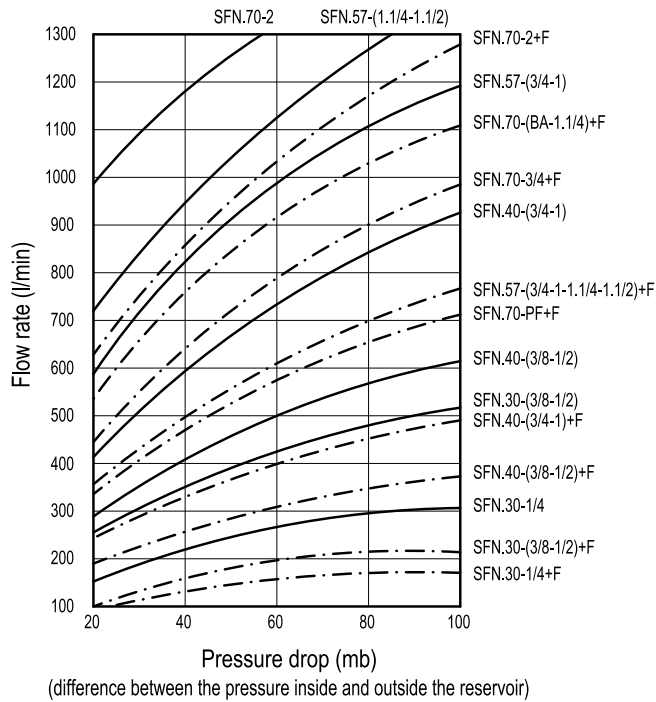


SFN.

metric units

Elesa Standards		Main dimensions					△△
Code	Description	d	h	D	L	d2	g
56151#	SFN.30-1/4	G 1/4	9.5	31	29.5	8	10
53901	SFN.30-3/8	G 3/8	9.5	31	29.5	10	10
53911	SFN.30-1/2	G 1/2	9.5	31	29.5	12	11
56181#	SFN.40-3/8	G 3/8	11.5	42	36.5	10	20
56201#	SFN.40-1/2	G 1/2	11.5	42	36.5	12	21
53921#	SFN.40-3/4	G 3/4	11.5	42	36.5	17	20
53931	SFN.40-1	G 1	11.5	42	36.5	18	20
56241#	SFN.57-3/4	G 3/4	14	57	42	18	38
56261	SFN.57-1	G 1	14	57	42	23	40
53932	SFN.57-1¼	G 1¼	16	57	44	32	41
53933	SFN.57-1½	G 1½	16	57	44	32	40
56381	SFN.70-2	G 2	17	70	59	23	79

Types available on request with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20).



SFN+F

metric units

Elesa Standards					Main dimensions					ΔΔ
Code	Description	d	h	D	L	d2	d3	d4	h1	g
56156#	SFN.30-1/4+F	G 1/4	9.5	31	29.5	8	-	-	-	10
56161	SFN.30-3/8+F	G 3/8	9.5	31	29.5	10	-	-	-	10
56171	SFN.30-1/2+F	G 1/2	9.5	31	29.5	12	-	-	-	11
56191#	SFN.40-3/8+F	G 3/8	11.5	42	36.5	10	-	-	-	19
56211#	SFN.40-1/2+F	G 1/2	11.5	42	36.5	12	-	-	-	20
56221#	SFN.40-3/4+F	G 3/4	11.5	42	36.5	17	-	-	-	20
56231	SFN.40-1+F	G 1	11.5	42	36.5	18	-	-	-	21
56251#	SFN.57-3/4+F	G 3/4	14	57	42	18	-	-	-	37
56271	SFN.57-1+F	G 1	14	57	42	23	-	-	-	38
56281	SFN.57-1¼+F	G 1¼	16	57	44	32	-	-	-	39
56291	SFN.57-1½+F	G 1½	16	57	44	32	-	-	-	40
54701#	SFN.70-3/4+F	G 3/4	15	70	63	16	35	-	6	76
54711	SFN.70-1¼+F	G 1¼	17	70	59	23	-	-	-	77
56391	SFN.70-2+F	G 2	17	70	59	23	-	-	-	82

SFN.70-BA+F

metric units

54731	SFN.70-BA+F	-	14	70	56	23	-	39	-	85
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Types available on request with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20).

Breather caps



• Material

Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

- **Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".

- **Threaded connector:** black colour, semi-matte finish.

• Flat packing ring

NBR synthetic rubber.

• Standard execution

- **SFN+F:** with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ.

• Maximum continuous working temperature

212°F (100°C).

Special executions on request

- Cover, RAL 2004 orange, without "OIL" mark.

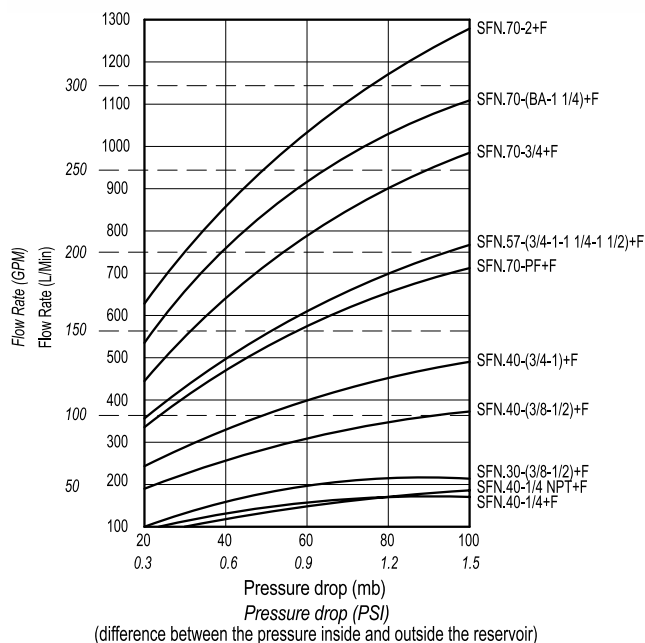
- Black cover with or without "OIL" mark.

Features and applications

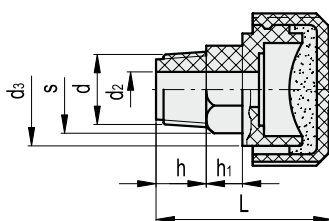
SFN. breather caps, owing to their high air flow rate, are particularly suitable for use on hydraulic power packs or tanks subject to rapid changes in liquid volume.

Technical data

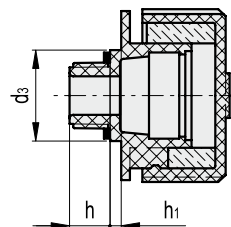
Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.



SFN-NPT+F
(D=1.22-1.65-2.24)



SFN-NPT+F
(D=2.76)



american units

Elesa Standards		Main dimensions								△
Code	Description	d	h	D	L	d2	d3	h1	s	lbs
956156	SFN.30-1/4 NPT+F	1/4 NPT	0.39	1.22	1.38	0.28	0.79	0.28	5/8	0.022
956181	SFN.40-1/4 NPT+F	1/4 NPT	0.39	1.65	1.54	0.28	1.18	0.28	5/8	0.044
956191	SFN.40-3/8 NPT+F	3/8 NPT	0.59	1.65	1.73	0.31	1.18	0.28	3/4	0.046
956211	SFN.40-1/2 NPT+F	1/2 NPT	0.67	1.65	1.81	0.47	1.18	0.28	1	0.048
956221	SFN.40-3/4 NPT+F	3/4 NPT	0.71	1.65	1.81	0.67	1.18	0.28	1 1/8	0.051
956251	SFN.57-3/4 NPT+F	3/4 NPT	0.71	2.24	1.97	0.63	1.54	0.28	1 1/8	0.088
954701	SFN.70-3/4 NPT+F	3/4 NPT	0.59	2.76	2.48	0.63	1.38	0.24	-	0.17

Breather caps with splash guard



Material

Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

- **Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".

- **Threaded connector:** black, semi-matte finish.

Flat packing ring

NBR synthetic rubber.

Splash guard

Technopolymer.

Standard executions available

- **SFP+F:** with tightening hexagon and "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ.

Maximum continuous working temperature

212°F (100°C).

Special executions on request

- Cover, RAL 2004 orange, without "OIL" mark.

- Black cover with or without "OIL" mark.

- Filler breathers without filter.

- SFP30 filler breathers available with metric threads.

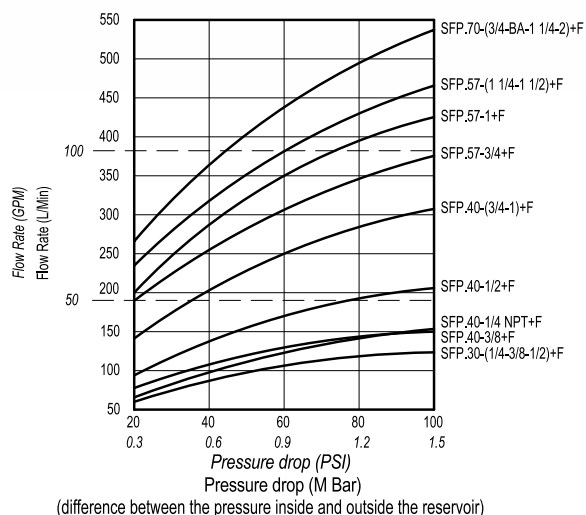
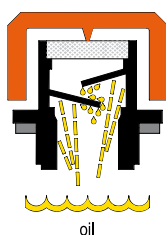
Features and applications

SFP breather caps come complete with splash guard device (ELESA original design) that prevents oil loss and are particularly suitable for use where oil is violently agitated and could be splashed against breather cap.

Technical data

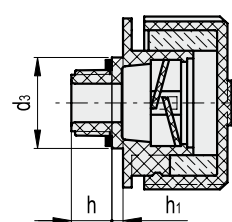
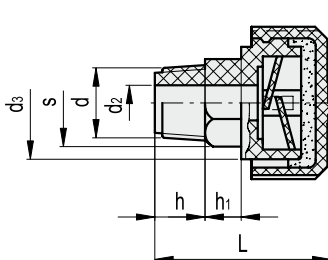
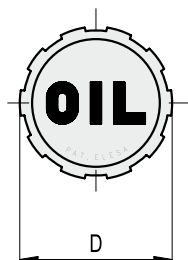
Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.

Operating layout



SFP-NPT+F
(D=1.22-1.65-2.24)

SFP-NPT+F
(D=2.76)



american units

Elesa Standards		Main dimensions								Δ
Code	Description	d	h	D	L	d2	d3	h1	s	lbs
953938	SFP.30-1/4 NPT+F	1/4 NPT	0.39	1.22	1.38	0.28	0.79	0.28	5/8	0.026
956652	SFP.40-1/4 NPT+F	1/4 NPT	0.39	1.65	1.54	0.28	1.18	0.28	5/8	0.051
956662	SFP.40-3/8 NPT+F	3/8 NPT	0.59	1.65	1.73	0.31	1.18	0.28	3/4	0.053
956682	SFP.40-1/2 NPT+F	1/2 NPT	0.67	1.65	1.81	0.47	1.18	0.28	1	0.057
954222	SFP.40-3/4 NPT+F	3/4 NPT	0.71	1.65	1.81	0.67	1.18	0.28	1 1/8	0.062
956712	SFP.57-3/4 NPT+F	3/4 NPT	0.71	2.24	1.97	0.63	1.54	0.28	1 1/8	0.106
954851	SFP.70-3/4 NPT+F	3/4 NPT	0.59	2.76	2.48	0.63	1.38	0.24	-	0.176

Breather caps
with splash guard



- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
 - **Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".
 - **Threaded connector:** black, semi-matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Splash guard**
Technopolymer.
- **Standard executions**
 - **SFP:** without air filter (black splash guard).
 - **SFP+F:** with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ (grey splash guard) or with "tech-fil" air filter in zinc-plated steel wire (orange splash guard).
 - **SFP.70-BA+F:** with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ (grey splash guard).Zinc-plated steel sheet bayonet.
Chrome-plated steel safety chain.
- **Maximum continuous working temperature**
100°C.

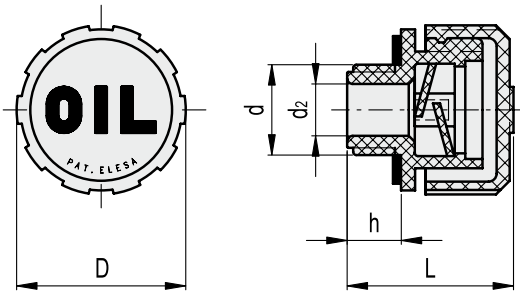
- Special executions on request**
- Cover, RAL 2004 orange, without "OIL" mark.
 - Black cover with or without "OIL" mark.
 - Threaded connector also with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20) for the codes marked with # in the table.

Features and applications
SFP. breather caps come complete with splash guard device (ELESA original design) that prevents oil loss and are particularly suitable for use where oil is violently agitated and could be splashed against breather cap.

Technical data
Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.

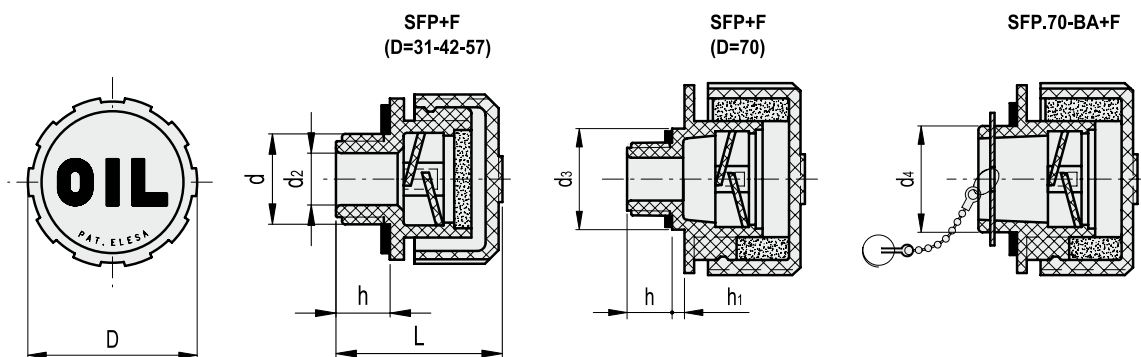
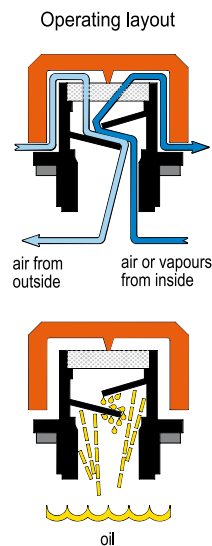
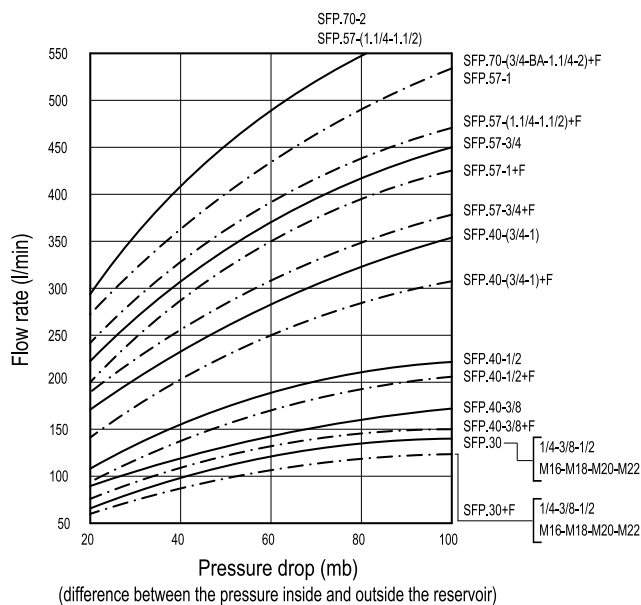


Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
31	1.22
42	1.65
57	2.24
70	2.76





SFP.		metric units					
Elesa Standards		Main dimensions					
Code	Description	d	h	D	L	d2	g
53941	SFP.30-16x1.5	M16x1.5	9.5	31	29.5	10	10
53961	SFP.30-18x1.5	M18x1.5	9.5	31	29.5	10	10
53981	SFP.30-20x1.5	M20x1.5	9.5	31	29.5	12	11
53991	SFP.30-22x1.5	M22x1.5	9.5	31	29.5	12	11
53935#	SFP.30-1/4	G 1/4	9.5	31	29.5	8	10
54001	SFP.30-3/8	G 3/8	9.5	31	29.5	10	11
54101	SFP.30-1/2	G 1/2	9.5	31	29.5	12	11
56651#	SFP.40-3/8	G 3/8	11.5	42	36.5	10	20
56671#	SFP.40-1/2	G 1/2	11.5	42	36.5	12	22
54201#	SFP.40-3/4	G 3/4	11.5	42	36.5	18	22
54301	SFP.40-1	G 1	11.5	42	36.5	18	22
56701#	SFP.57-3/4	G 3/4	14	57	42	18	40
56731	SFP.57-1	G 1	14	57	42	23	40
54401	SFP.57-1¼	G 1¼	16	57	44	32	41
54501	SFP.57-1½	G 1½	16	57	44	32	45
54876	SFP.70-2	G 2	17	70	59	23	82

Types available on request with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20).



SFP+F

metric units

Elesa Standards					Main dimensions							
Tech-fil	Tech-foam											
Code		Description	d	h	D	L	d2	d3	d4	h1	g	
53951	53952	SFP.30-16x1.5+F*	M16x1.5	9.5	31	29.5	10	-	-	-	12	
53971	53972	SFP.30-18x1.5+F*	M18x1.5	9.5	31	29.5	10	-	-	-	13	
53986	53987	SFP.30-20x1.5+F*	M20x1.5	9.5	31	29.5	12	-	-	-	13	
53996	53997	SFP.30-22x1.5+F*	M22x1.5	9.5	31	29.5	12	-	-	-	14	
53937	53938	SFP.30-1/4+F*	G 1/4	9.5	31	29.5	8	-	-	-	11	
54021	54022	SFP.30-3/8+F*	G 3/8	9.5	31	29.5	10	-	-	-	13	
54121	54122	SFP.30-1/2+F*	G 1/2	9.5	31	29.5	12	-	-	-	15	
56661	56662#	SFP.40-3/8+F*	G 3/8	11.5	42	36.5	10	-	-	-	23	
56681	56682#	SFP.40-1/2+F*	G 1/2	11.5	42	36.5	12	-	-	-	26	
54221	54222#	SFP.40-3/4+F*	G 3/4	11.5	42	36.5	18	-	-	-	28	
54321	54322	SFP.40-1+F*	G 1	11.5	42	36.5	18	-	-	-	24	
56711	56712#	SFP.57-3/4+F*	G 3/4	14	57	42	18	-	-	-	50	
56741	56742	SFP.57-1+F*	G 1	14	57	42	23	-	-	-	50	
54421	54422	SFP.57-1¼+F*	G 1¼	16	57	44	32	-	-	-	50	
54521	54522	SFP.57-1½+F*	G 1½	16	57	44	32	-	-	-	54	
-	54851#	SFP.70-3/4+F*	G 3/4	15	70	63	16	35	-	6	80	
-	54861	SFP.70-1¼+F*	G 1¼	17	70	59	23	-	-	-	80	
-	54878	SFP.70-2+F*	G 2	17	70	59	23	-	-	-	85	

SFP.70-BA+F

metric units

-	54881	SFP.70-BA+F*	-	14	70	56	23	-	39	-	91
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Types available on request with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20).

* Complete the description of the standard item needed by adding the type of the air filter tech-fil or tech-foam listed in the code column.

Breather caps with splash guard and flat dipstick



• Material

Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

- **Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".

- **Threaded connector:** black, semi-matte finish.

• Flat packing ring

NBR synthetic rubber.

• Flat dipstick

Phosphatised steel. On request dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.

• Splash guard

Technopolymer.

• Standard execution

- **SFP+F+a:** D = 31, 42 and 57 with "tech-fil" air filter in zinc-plated steel wire (orange splash guard); D = 70 with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ (grey splash guard).

• Maximum continuous working temperature

212°F (100°C).

Special executions on request

- Cover, RAL 2004 orange, without "OIL" mark.

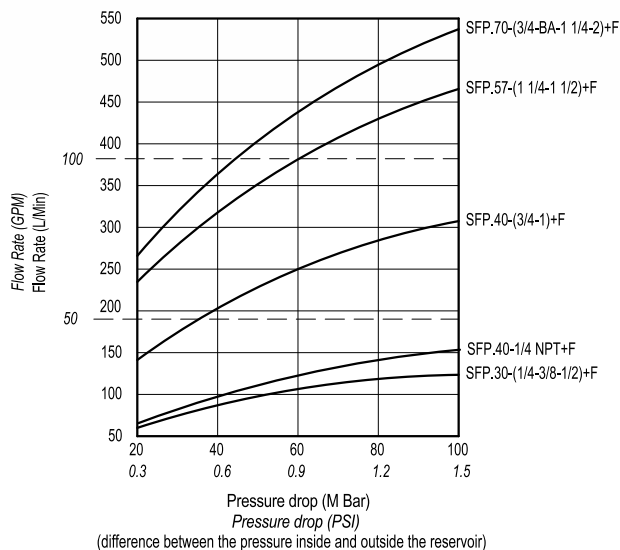
- Black cover with or without "OIL" mark.

Features and applications

SFP+a breather caps come complete with splash guard device (ELESA originale design) that prevents oil loss and are particularly suitable for use where oil is violently agitated and could be splashed against the breather cap.

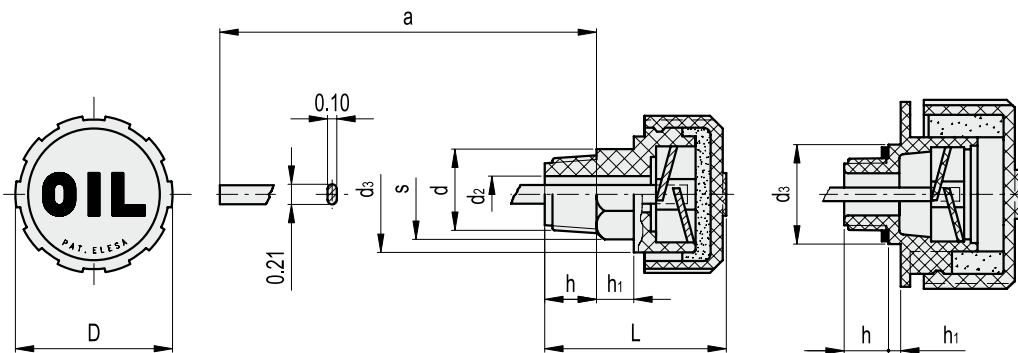
Technical data

Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.



SFP-NPT+F+a
(D=1.22-1.65-2.24)

SFP-NPT+F+a
(D=2.76)



american units

Elesa Standards		Main dimensions								
Code	Description	d	h	D	L	d2	d3	h1	s	a
953938-L*	SFP.30-1/4 NPT+F+a-L*	1/4 NPT	0.39	1.22	1.38	0.28	0.79	0.28	5/8	L*
956652-L*	SFP.40-1/4 NPT+F+a-L*	1/4 NPT	0.39	1.65	1.54	0.28	1.18	0.28	5/8	L*
956662-L*	SFP.40-3/8 NPT+F+a-L*	3/8 NPT	0.59	1.65	1.73	0.31	1.18	0.28	3/4	L*
956682-L*	SFP.40-1/2 NPT+F+a-L*	1/2 NPT	0.67	1.65	1.81	0.47	1.18	0.28	1	L*
954222-L*	SFP.40-3/4 NPT+F+a-L*	3/4 NPT	0.71	1.65	1.81	0.67	1.18	0.28	1 1/8	L*
956712-L*	SFP.57-3/4 NPT+F+a-L*	3/4 NPT	0.71	2.24	1.97	0.63	1.54	0.28	1 1/8	L*
954851-L*	SFP.70-3/4 NPT+F+a-L*	3/4 NPT	0.59	2.76	2.48	0.63	1.38	0.24	-	L*

* Dipstick length on request.

SFN-PF+F

ELESA Original design

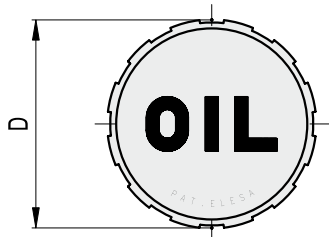
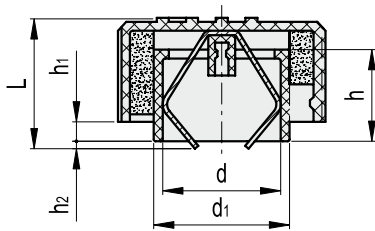
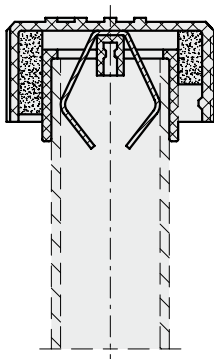
Breather cap push-fit



- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
 - **Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".
 - **Threaded connector:** black colour, semi-matte finish.
- **Assembly**
Push-fit on pipes with max outside diameter of 39 mm and min inside diameter of 32 mm.
- **Clip**
Black-oxide steel.
- **Ring-shaped air filter**
"Tech-foam" polyurethane foam mesh (polyester base), air filtration 40 µ.
- **Maximum continuous working temperature**
100°C.

Special executions on request

- Cover, RAL 2004 orange, without "OIL" mark.
- Black cover with or without "OIL" mark.



Conversion Table 1 mm = 0,039 inch			
D		d1	
mm	inch	mm	inch
70	2.76	45.5	1.79

metric units

Elesa Standards		Main dimensions							ΔΔ
Code	Description	d	h	D	L	d1	h1	h2	g
54761	SFN.70-PF+F	39.5	27.5	70	43	45.5	2.5	6.5	67

Breather caps with splash guard and flat dipstick



- Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
 - Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".
 - Threaded connector:** black, semi-matte finish.
- Flat packing ring**
NBR synthetic rubber.
- Flat dipstick**
Phosphatised steel. On request dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.
- Splash guard**
Technopolymer.
- Standard executions**
 - SFP+a:** without air filter (black splash guard).
 - SFP+F+a:** D = 31, 42 and 57 with "tech-fil" air filter in zinc-plated steel wire (orange splash guard); D = 70 with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ (grey splash guard).
 - SFP.70-BA+F+a:** with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ (grey splash guard).
- Zinc-plated steel sheet bayonet.
- Chrome-plated steel safety chain.
- Maximum continuous working temperature**
100°C.

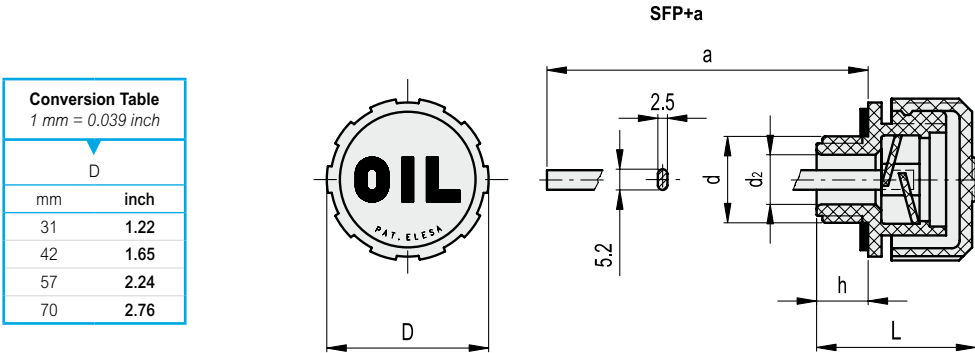
- Special executions on request**
- Cover, RAL 2004 orange, without "OIL" mark.
 - Black cover with or without "OIL" mark.

Features and applications

SFP+a breather caps come complete with splash guard device (ELESA originale design) that prevents oil loss and are particularly suitable for use where oil is violently agitated and could be splashed against the breather cap.

Technical data

Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.

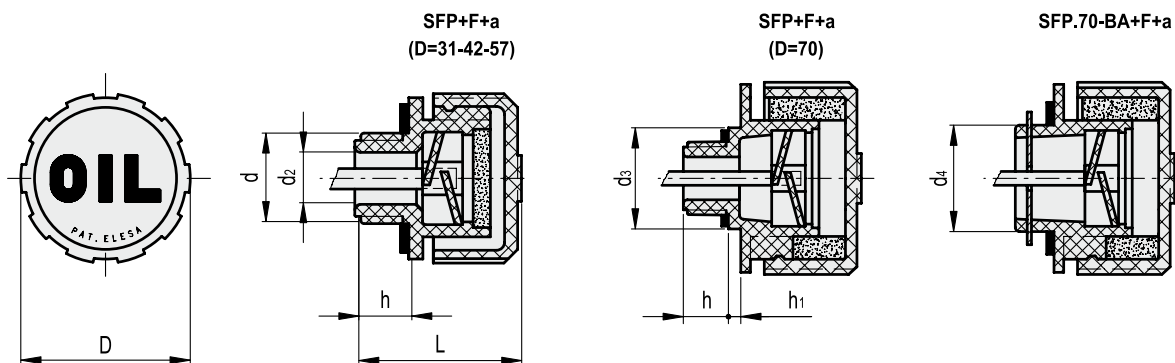
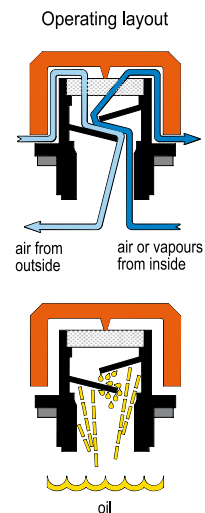
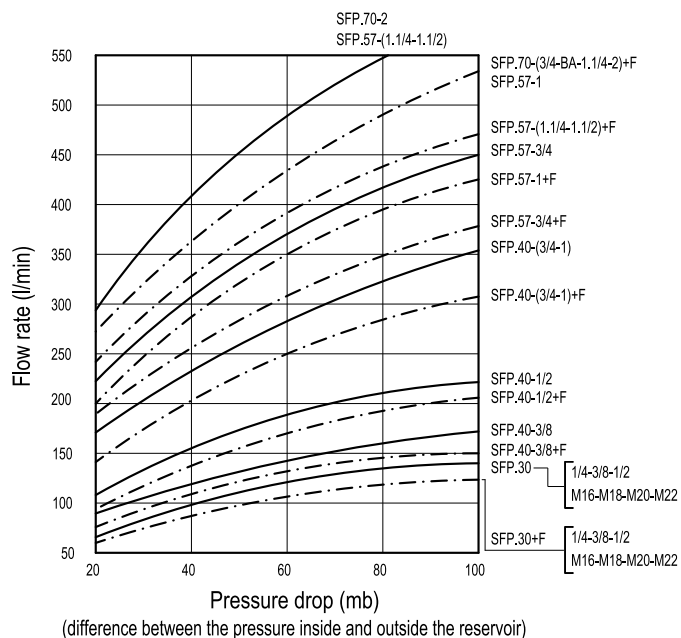


Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
31	1.22
42	1.65
57	2.24
70	2.76

SFP+a

metric units

Elesa Standards		Main dimensions							⚠
Code	Description	d	h	D	L	d2	a	g	
53946	SFP.30-16x1.5+a	M16x1.5	9.5	31	29.5	10	188	30	
53966	SFP.30-18x1.5+a	M18x1.5	9.5	31	29.5	10	188	30	
53983	SFP.30-20x1.5+a	M20x1.5	9.5	31	29.5	12	188	31	
53993	SFP.30-22x1.5+a	M22x1.5	9.5	31	29.5	12	188	31	
53936	SFP.30-1/4+a	G 1/4	9.5	31	29.5	8	188	30	
54011	SFP.30-3/8+a	G 3/8	9.5	31	29.5	10	188	30	
54111	SFP.30-1/2+a	G 1/2	9.5	31	29.5	12	188	30	
54211	SFP.40-3/4+a	G 3/4	11.5	42	36.5	18	184	42	
54311	SFP.40-1+a	G 1	11.5	42	36.5	18	184	44	
54411	SFP.57-1¼+a	G 1¼	16	57	44	32	184	63	
54511	SFP.57-1½+a	G 1½	16	57	44	32	184	65	
54877	SFP.70-2+a	G 2	17	70	59	23	179	106	



SFP+F+a

metric units

Elesa Standards		Main dimensions									△△
Code	Description	d	h	D	L	d2	d3	d4	h1	a	g
53956	SFP.30-16x1.5+F+a	M16x1.5	9.5	31	29.5	10	-	-	-	188	34
53976	SFP.30-18x1.5+F+a	M18x1.5	9.5	31	29.5	10	-	-	-	188	34
53989	SFP.30-20x1.5+F+a	M20x1.5	9.5	31	29.5	12	-	-	-	188	32
53999	SFP.30-22x1.5+F+a	M22x1.5	9.5	31	29.5	12	-	-	-	188	33
53939	SFP.30-1/4+F+a	G 1/4	9.5	31	29.5	8	-	-	-	188	31
54031	SFP.30-3/8+F+a	G 3/8	9.5	31	29.5	10	-	-	-	188	33
54131	SFP.30-1/2+F+a	G 1/2	9.5	31	29.5	12	-	-	-	188	34
54231	SFP.40-3/4+F+a	G 3/4	11.5	42	36.5	18	-	-	-	184	50
54331	SFP.40-1+F+a	G 1	11.5	42	36.5	18	-	-	-	184	50
54431	SFP.57-1/4+F+a	G 1/4	16	57	44	32	-	-	-	184	75
54531	SFP.57-1/2+F+a	G 1/2	16	57	44	32	-	-	-	184	75
54853	SFP.70-3/4+F+a	G 3/4	15	70	63	16	35	-	6	173	100
54863	SFP.70-1/4+F+a	G 1/4	17	70	59	23	-	-	-	179	105
54879	SFP.70-2+F+a	G 2	17	70	59	23	-	-	-	179	110

SFP.70-BA+F+a

54883	SFP.70-BA+F+a	-	14	70	56	23	-	39	-	179	100
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Breather caps with splash guard



• Material

Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

- **Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".

- **Threaded connector:** black colour, semi-matte finish.

• Flat packing ring

NBR synthetic rubber.

• Splash guard

Technopolymer.

• Standard executions

- **SFP-EX:** without air filter (black splash guard).

- **SFP+F-EX:** with "tech-foam" air filter in polyurethane foam mesh (polyester base), air filtration 40 µ (grey splash guard).

• ATEX directive compliance

The breather caps of the SFP-EX series comply with Health and Safety Requirements intended in 94/9/EC ATEX European Directive (explosive atmospheres) for equipments in Group II, category 2GD.

II 2 G D IIB T6, marked on the SFP-EX breather caps, represents the identification according to ATEX directive.

II: group of substances for which the product is suitable

2: identification of the category

G: identification of the type of explosive atmosphere (Gases or vapours)

D: identification of the type of explosive atmosphere (Dust)

IIB: group of explosive gases

T6: temperature class

Ambient and/or fluid temperature: -30 ÷ +80°C

The declaration of conformity to European Directives of this product is available and it is part of the product itself.

Features and applications

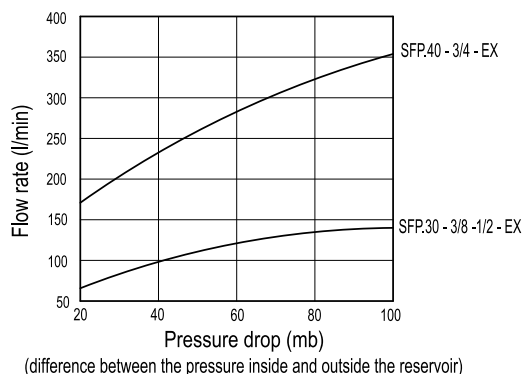
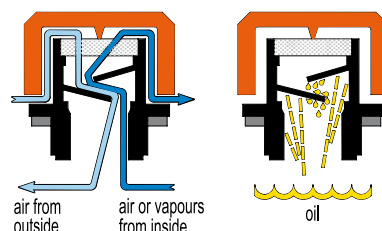
SFP-EX breather caps come complete with splash guard device (ELESA original design) that prevents oil loss and are particularly suitable for use where oil is violently agitated and could be splashed against breather cap.

Technical data

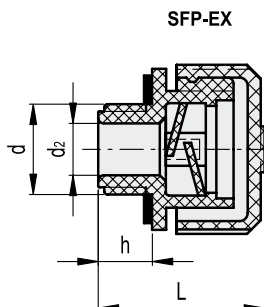
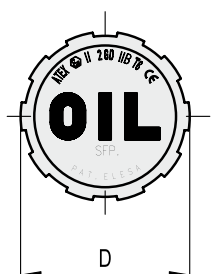
Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.



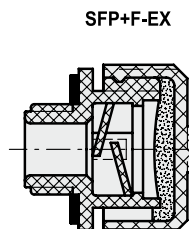
Operating layout



Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
31	1.22
42	1.65



SFP-EX



SFP+F-EX

SFP+EX

metric units

Elesa Standards		Main dimensions						Δ
Code	Description	d	h	D	L	d2	g	
54001-EX	SFP.30-3/8-EX	G 3/8	9.5	31	29.5	10	11	
54101-EX	SFP.30-1/2-EX	G 1/2	9.5	31	29.5	12	11	
54201-EX	SFP.40-3/4-EX	G 3/4	11.5	42	36.5	18	22	

SFP+F-EX

metric units

Elesa Standards		Main dimensions						Δ
Code	Description	d	h	D	L	d2	g	
54022-EX	SFP.30-3/8+F-EX	G 3/8	9.5	31	29.5	10	13	
54122-EX	SFP.30-1/2+F-EX	G 1/2	9.5	31	29.5	12	15	
54222-EX	SFP.40-3/4+F-EX	G 3/4	11.5	42	36.5	18	28	



Breather caps with splash guard and flat dipstick



- Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- Cover:** RAL 2004 orange, semi-matte finish, marked "OIL".
- Threaded connector:** black colour, semi-matte finish.
- Flat packing ring**
NBR synthetic rubber.
- Flat dipstick**
Phosphatised steel. On request dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.
- Splash guard**
Technopolymer.
- ATEX directive compliance**
The breather caps of the SFP+a-EX series comply with Health and Safety Requirements intended in 94/9/EC ATEX European Directive (explosive atmospheres) for equipments in Group II, category 2GD.
II 2 G D IIB T6, marked on the SFP-EX breather caps, represents the identification according to ATEX directive.
II: group of substances for which the product is suitable
2: identification of the category
G: identification of the type of explosive atmosphere (Gases or vapours)
D: identification of the type of explosive atmosphere (Dust)
IIB: group of explosive gases
T6: temperature class
Ambient and/or fluid temperature: -30 ÷ +80°C
The declaration of conformity to European Directives of this product is available and it is part of the product itself.

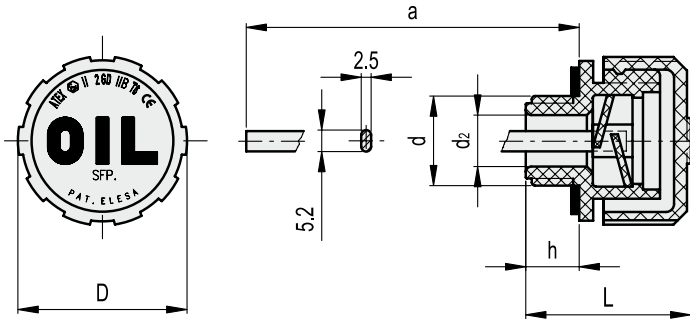
Features and applications

SFP+a-EX breather caps come complete with splash guard device (ELESA original design) that prevents oil loss and are particularly suitable for use where oil is violently agitated and could be splashed against breather cap.

Technical data

Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.

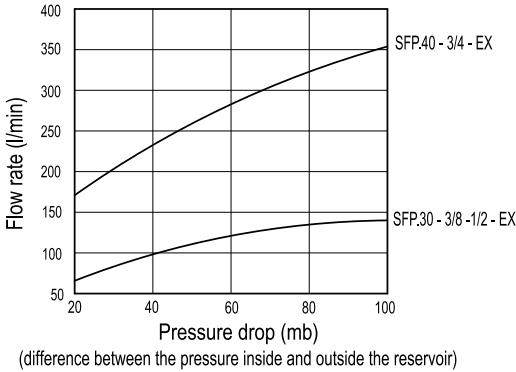
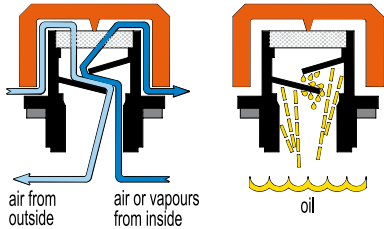
Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
31	1.22
42	1.65



Elesa Standards		Main dimensions						metric units
Code	Description	d	h	D	L	d2	a	g
54011-EX	SFP.30-3/8+a-EX	G 3/8	9.5	31	29.5	10	188	30
54111-EX	SFP.30-1/2+a-EX	G 1/2	9.5	31	29.5	12	188	30
54211-EX	SFP.40-3/4+a-EX	G 3/4	11.5	42	36.5	18	184	42



Operating layout



Valve breather caps



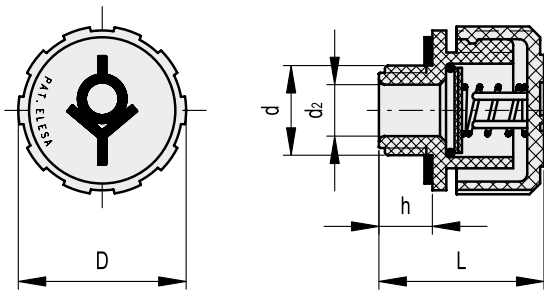
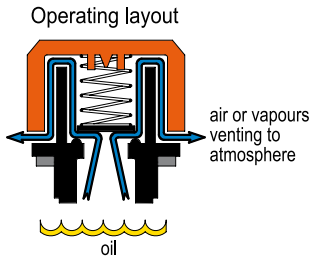
- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Cover:** RAL 2004 orange, semi-matte finish. Graphic symbol “valve”.
- **Threaded connector:** black colour, semi-matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Spring**
Stainless steel.
- **Standard executions**
 - **SFV-10 mb:** valve (sealing disk) opens when pressure exceeds 0.010 bar (set at 10 mb).
 - **SFV-100 mb:** valve (sealing disk) opens when pressure exceeds 0.100 bar (set at 100 mb).
- **Maximum continuous working temperature**
212°F (100°C).

Special executions on request

- Black cover.
- SFV. valve breather cap with metric threads

Features and applications

SFV. valve breather caps are particularly suitable for all those applications (speed reducers, variators or compressors) when the internal air pressure must not exceed a certain value (10 or 100 mb). In these cases, the safety valve of the cap allows the expulsion of the exceeding air in the reservoir, thus re-establishing the pressure values for which the valve is set. Sealing disc (closed in normal pressure conditions) prevents dust from getting in and oil-losses.



american units

Elesa Standards		Main dimensions						↕
10 mb	100 mb							
Code		Description	d	h	D	L	d2	lbs
954661	954666	SFV.3/8 NPT*	3/8 NPT	0.39	1.22	1.18	0.39	0.026
954671	954676	SFV.1/2 NPT*	1/2 NPT	0.39	1.22	1.18	0.39	0.024

* Complete the description of the standard item needed by adding the valve opening pressure.

Valve breather caps



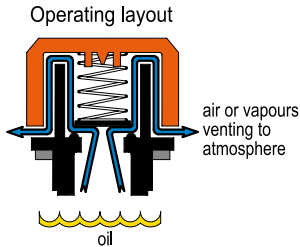
- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
 - **Cover:** RAL 2004 orange, semi-matte finish. Graphic symbol “valve”.
 - **Threaded connector:** black colour, semi-matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Sealing disk**
Technopolymer with NBR synthetic rubber O-ring.
- **Spring**
Stainless steel.
- **Standard executions**
 - **SFV-10 mb:** valve (sealing disk) opens when pressure exceeds 0.010 bar (set at 10 mb).
 - **SFV-100 mb:** valve (sealing disk) opens when pressure exceeds 0.100 bar (set at 100 mb).
- **Maximum continuous working temperature**
100°C.

Special executions on request

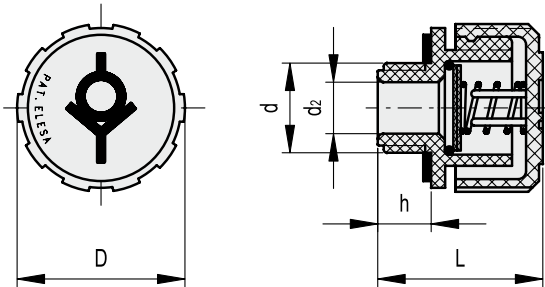
Black cover.

Features and applications

SFV. valve breather caps are particularly suitable for all those applications (speed reducers, variators or compressors) when the internal air pressure must not exceed a certain value (10 or 100 mb). In these cases, the safety valve of the cap allows the expulsion of the exceeding air in the reservoir, thus re-establishing the pressure values for which the valve is set. Sealing disc (closed in normal pressure conditions) prevents dust from getting in and oil-losses.



Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
31	1.22
42	1.65



metric units

Elesa Standards		Main dimensions						⚠
10 mb	100 mb							
Code		Description	d	h	D	L	d2	g
54611	54616	SFV.16x1.5*	M16x1.5	9.5	31	29.5	10	12
54621	54626	SFV.18x1.5*	M18x1.5	9.5	31	29.5	10	12
54631	54636	SFV.20x1.5*	M20x1.5	9.5	31	29.5	10	12
54641	54646	SFV.22x1.5*	M22x1.5	9.5	31	29.5	10	13
54651	54656	SFV.1/4*	G 1/4	9.5	31	29.5	8	11
54661	54666	SFV.3/8*	G 3/8	9.5	31	29.5	10	12
54671	54676	SFV.1/2*	G 1/2	9.5	31	29.5	10	12
54681	54686	SFV.3/4*	G 3/4	11.5	42	36.5	17	23
54691	54696	SFV.1*	G 1	11.5	42	36.5	17	25

* Complete the description of the standard item needed by adding the valve opening pressure.

Double-valve pressurised
breather caps



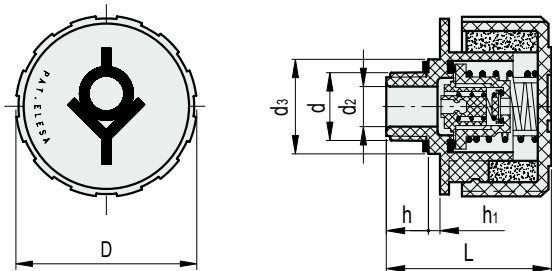
- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Cover:** RAL 2004 orange, semi-matte finish, with graphic symbol "valve".
- **Threaded connector:** black colour, semi-matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Overpressure valve**
Technopolymer with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.350 bar (0.700 bar on request).
- **Suction valve**
Technopolymer sealing disk with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.030 bar.
- **Ring-shaped air filter**
"Tech-foam" polyurethane foam mesh (polyester base), air filtration 40 µ.
- **Maximum continuous working temperature**
210°F (100°C).

Special executions on request
Black cover.

Features
The use of SFW. pressurised breather caps which create a pressure plenum chamber right above the oil level within tested limit conditions, in order to avoid any reservoir deformation, offers the following advantages:

- reduces reservoir air volume intake keeping clean oil and filter
- improves suction pump action during working conditions reducing cavitation phenomenon
- prevents fluid leakage when the system is part of a mobile unit
- reduces foam in fluid.

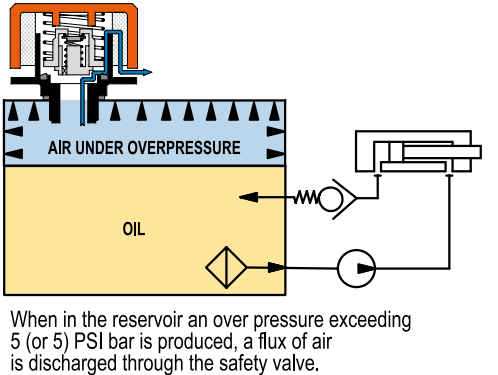
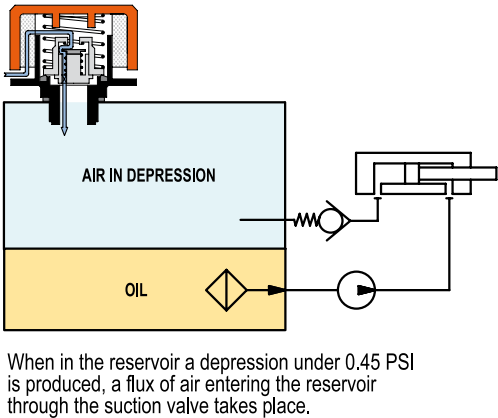
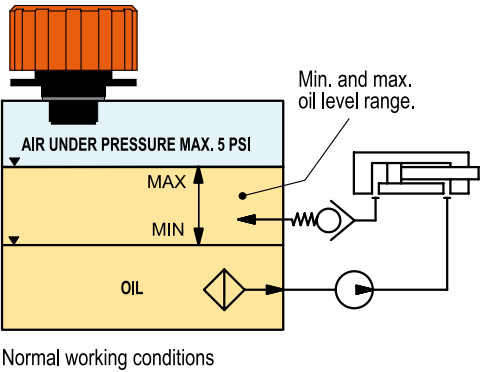
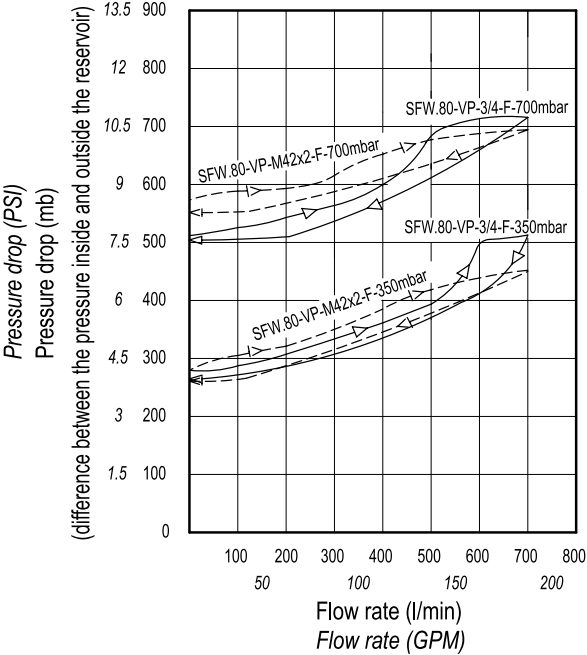
Technical data
Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.



american units

Elesa Standards		Main dimensions								⚖
Code	Description	d	h	D	L	d2	d3	d4	h1	lbs
954911	SFW.70-3/4 NPT+F-350 mb	3/4 NPT	0.59	2.76	2.48	0.63	1.42	-	0.24	0.231

SFW. pressurised breather cap functioning in a hydraulic circuit



Double-valve pressurised breather caps



• Material

Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.

- **Cover:** RAL 2004 orange, semi-matte finish, with graphic symbol "valve".

- **Threaded connector:** black colour, semi-matte finish.

• Flat packing ring

NBR synthetic rubber.

• Overpressure valve

Technopolymer with NBR synthetic rubber O-ring and stainless steel spring. Set at around 0.350 bar (on request 0.700 bar).

• Suction valve

Technopolymer sealing disk with NBR synthetic rubber O-ring and stainless steel spring. Set at around 0.030 bar.

• Ring-shaped air filter

"Tech-foam" polyurethane foam mesh (polyester base), air filtration 40 µ.

• Flat dipstick

Flat section phosphatised steel. On request and for sufficient quantities dipstick can be supplied in different lengths and/or complete with MAX-MIN level lines.

• Standard executions

- **SFW+F:** without flat dipstick.

- **SFW-BA+F:** with zinc-plated steel sheet bayonet, without flat dipstick. Chrome-plated steel safety chain.

- **SFW+F+a:** with flat dipstick.

- **SFW-BA+F+a:** with zinc-plated steel sheet bayonet and flat dipstick. Chrome-plated steel safety chain.

• Maximum continuous working temperature

100°C.

Special executions on request

- Black cover.

- Threaded connector also with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20) for the codes marked with # in the table.

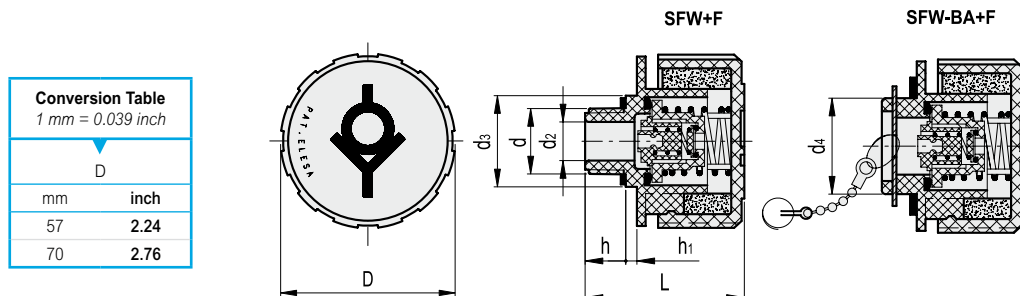
Features

The use of SFW. pressurised breather caps which create a pressure plenum chamber right above the oil level within tested limit conditions, in order to avoid any reservoir deformation, offers the following advantages:

- reduces reservoir air volume intake keeping clean oil and filter
- improves suction pump action during working conditions reducing cavitation phenomenon
- prevents fluid leakage when the system is part of a mobile unit
- reduces foam in fluid.

Technical data

Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.



SFW+F

metric units

Elesa Standards				Main dimensions						↕
Code	Description	d	h	D	L	d2	d3	d4	h1	g
54801	SFW.57-3/4+F-350 mb	G 3/4	13	57	48	16	35	-	6	67
54911#	SFW.70-3/4+F-350 mb	G 3/4	15	70	63	16	35	-	6	98
54921	SFW.70-1¼+F-350 mb	G 1¼	17	70	59	25	-	-	-	101
54931	SFW.70-2+F-350 mb	G 2	17	70	59	25	-	-	-	108

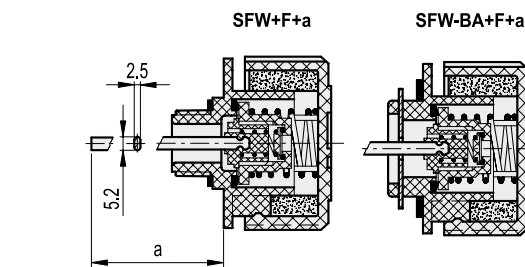
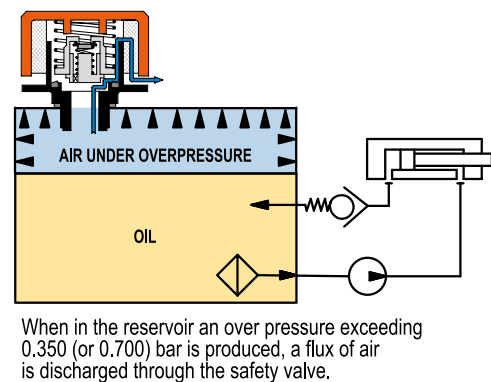
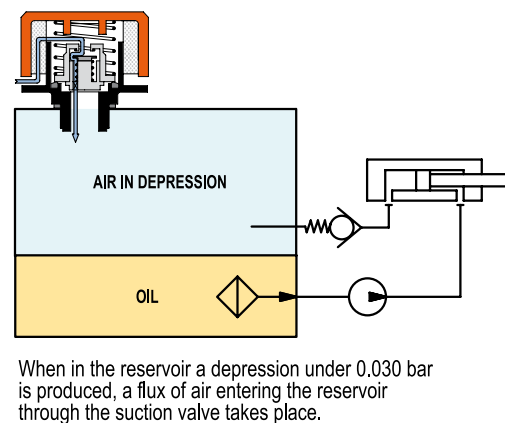
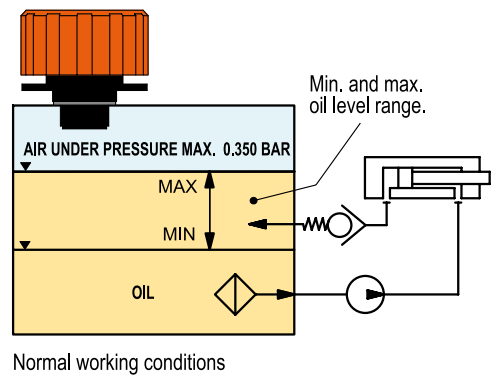
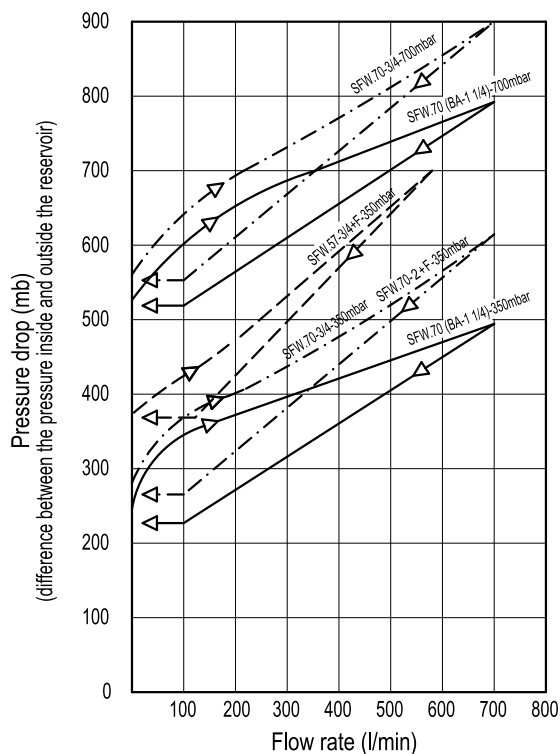
SFW-BA+F

metric units

54941	SFW.70-BA+F-350 mb	-	14	70	56	25	-	39	-	105
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Types available on request with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20).

SFW. pressurised breather cap functioning in a hydraulic circuit



SFW+F+a

metric units

Elesa Standards			Main dimensions								△△
Code	Description	d	h	D	L	d2	d3	d4	h1	a	g
54913#	SFW.70-3/4-F+a-350 mb	G 3/4	15	70	63	16	35	-	6	188	117
54923	SFW.70-1 1/4-F+a-350 mb	G 1 1/4	17	70	59	25	-	-	-	195	120

SFW-BA+F+a

metric units

54943	SFW.70-BA-F+a-350 mb	-	14	70	56	25	-	39	-	195	124
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Types available on request with NPT thread (National Taper pipe Thread - ANSI-ASME B1-20).

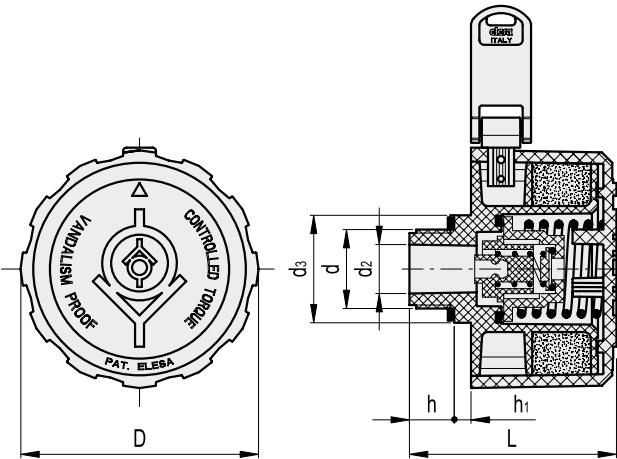
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Double-valve pressurised
breather caps
vandal-proof



- **Material**
 - **Cover:** polyamide based (PA) technopolymer, black colour, matte finish. Resistant to solvents, oils, greases and other chemical agents. Graphic symbol "double valve".
 - **Threaded connector:** acetal based technopolymer (POM), black colour, matte finish.
- **Flat packing ring**
NBR synthetic rubber.
- **Overpressure valve**
Technopolymer with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.350 bar (on request 0.700 bar).
- **Suction valve**
Technopolymer sealing disk with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.030 bar.
- **Ring-shaped air filter**
"Tech-foam" polyurethane foam mesh (polyester base), air filtration 40 µ.
- **Key**
Acetal resin-based (POM) technopolymer, red colour, with stainless steel anti-intrusion-profile insert. Folding. On request it can be supplied in black colour too.
- **Maximum continuous working temperature**
100°C.
- **"Vandal-proof" safety device (ELESA patent)**
It is especially designed to prevent the cap from being unscrewed without permission. It is provided with a "controlled-torque" mechanism which guarantees the best seal of the packing ring.

Special executions on request
Flat dipstick, flat section phosphatised steel.



Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
80	3.15

metric units

Elesa Standards		Main dimensions							ΔΔ
Code	Description	d	D	L	h	h1	d2	d3	g
54961	SFW.80-VP-3/4-F-350mb	G 3/4	80	68	15	5.5	16	36	140
54967	SFW.80-VP-M42x2-F-350mb	M42x2	80	74	21	4	32	47	150

SFW-VP. pressurised breather cap functioning in a hydraulic circuit

Features

The use of SFW-VP pressurised breather cap which create a pressure plenum chamber right above the oil level within tested limit conditions, in order to avoid any reservoir deformation, offers also other advantages (see example of functioning in the SFW. sheet (see page 42)

Applications

SFW-VP pressurised breather caps are suitable for material handling equipment, machines for the agriculture sector and in general for those machines which remain unattended.

Thanks to its small dimensions, the key can be kept together with others (e.g. starting key of the engine).

Technical data

Air flow rate for each model can be determined from the graph calculating the difference between the pressure inside and outside the reservoir.

"Vandal-proof" safety device functioning

- Cap screwing.

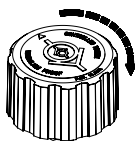
Take out the key and screw the cap clockwise until the friction-click controlled torque mechanism is engaged so that to guarantee the best sealing of the packing ring. The maximum torque is reached at the first mechanism release (click). After that, the cap can neither be screwed (to protect the packing ring) nor unscrewed (to protect the cap from any tampering attempt).

WARNING: during screwing the key must not be inserted.

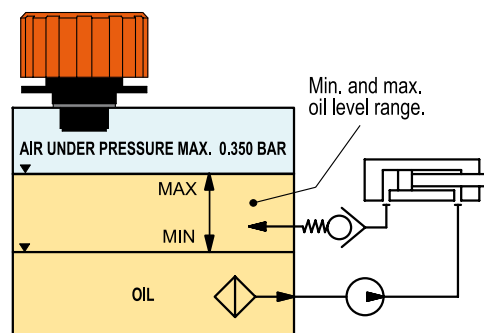
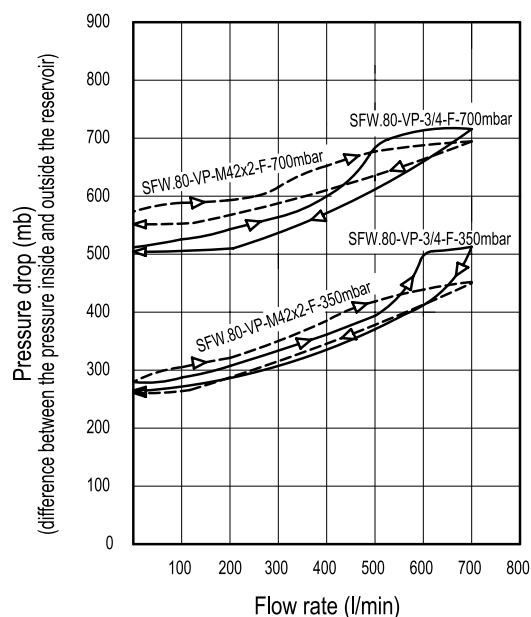
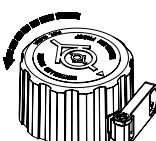
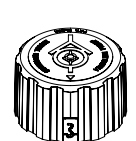
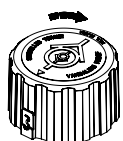
- Cap unscrewing.

Turn the cap clockwise until one of the two resistance points is reached. Only at one of these two positions the key, which couples the cover to the threaded connector, can be completely inserted and the cap can be unscrewed.

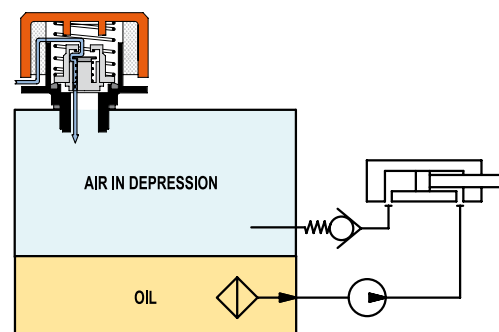
1. SCREWING



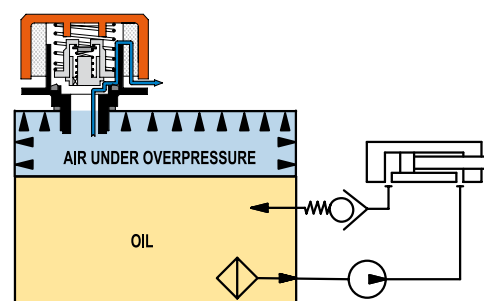
2. UNSCREWING



Normal working conditions



When in the reservoir a depression under 0.030 bar is produced, a flux of air entering the reservoir through the suction valve takes place.

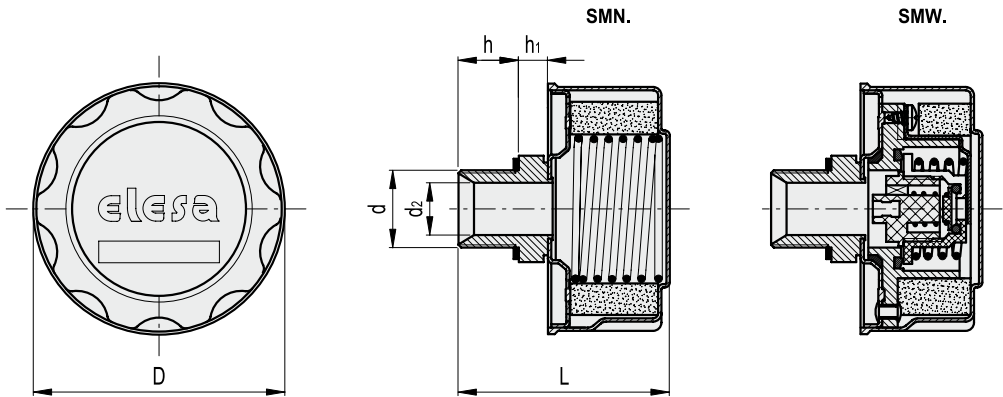


When in the reservoir an over pressure exceeding 0.350 (or 0.700) bar is produced, a flux of air is discharged through the safety valve.

Breather caps and double-valve breather caps



- **Material**
 - **Cover:** steel sheet, with chrome plating superficial treatment.
 - **Flange:** zinc-plated steel sheet.
 - **Threaded connector:** zinc-plated steel.
 - **Flat packing ring**
NBR synthetic rubber (only GAS execution)
 - **Overpressure valve (only for SMW.)**
Technopolymer with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.350 bar (0.700 bar on request).
 - **Suction valve (only for SMW.)**
Technopolymer sealing disk with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.030 bar.
 - **Ring shape air filter**
Tech-foam 40 µ.
 - **Filter setting spring (only for SMN.)**
Zinc-plated steel.
 - **Standard executions**
 - **SMN.:** breather cap.
 - **SMW.:** double-valve breather cap.
 - **Maximum continuous working temperature**
212°F (100°C).
- Special executions on request**
With dipstick for fluid level indication (only for SMW.).



SMN.

american units

Elesa Standards		Main dimensions						↕
Code	Description	d	h	D	L	d2	h1	lbs
956833	SMN.46-1/4 NPT-F40	1/4 NPT	0.39	1.85	2.01	0.28	0.2	0.126
956883	SMN.80-3/4 NPT-F40	3/4 NPT	0.63	3.19	2.76	0.67	0.47	0.526

SMW.

american units

Elesa Standards		Main dimensions						↕
Code	Description	d	h	D	L	d2	h1	lbs
956983	SMW.80-3/4 NPT-F40-350mb	3/4 NPT	0.63	3.19	2.76	0.67	0.47	0.678

SMW. pressurised breather cap functioning in a hydraulic circuit

Features and applications

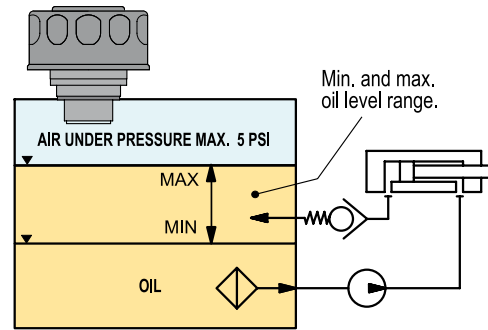
Double-valve breather cap SMW. creates a pressure plenum chamber right above the oil level within given limit conditions in order to avoid any reservoir deformation.

Advantages:

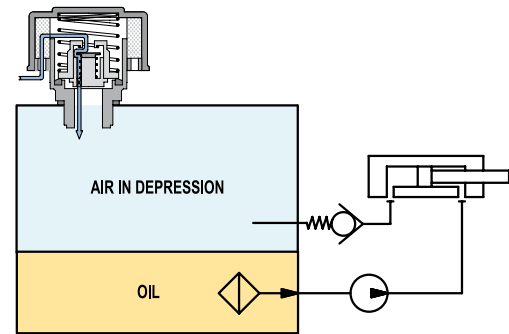
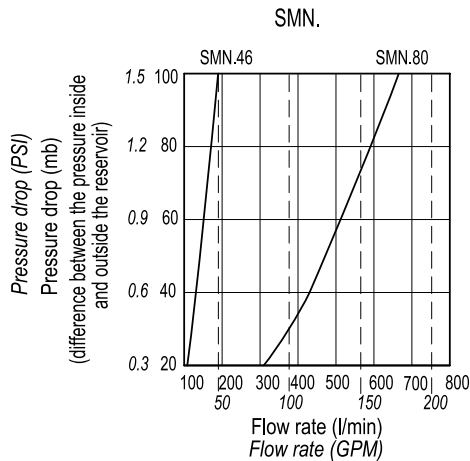
- it reduces reservoir air volume intake keeping clean fluid and filter;
- it improves suction pump action under working conditions reducing cavitation phenomenon;
- it prevents fluid leakage when the system is part of a mobile unit;
- it reduces foam in fluid.

Technical data

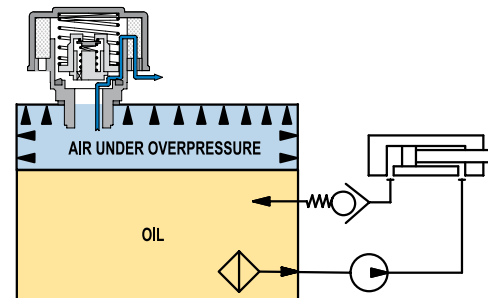
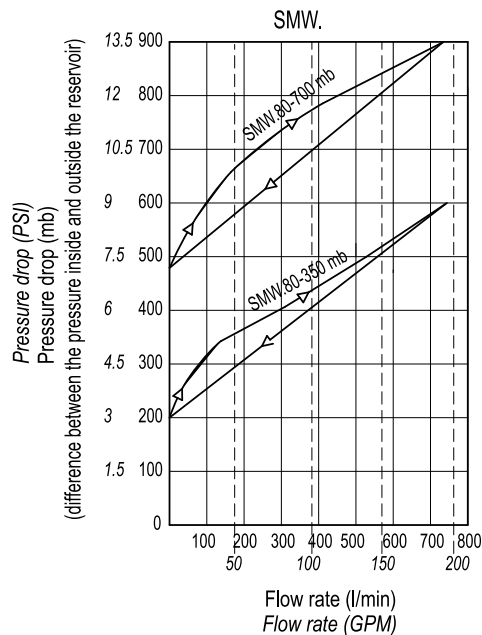
Air flow rate for the different executions of breather caps can be obtained from the diagram on the basis of the difference of air pressure inside and outside the reservoir.



Normal working conditions



When in the reservoir a depression under 0.45 PSI is produced, a flux of air entering the reservoir through the suction valve takes place.



When in the reservoir an over pressure exceeding 5 (or 10) PSI is produced, a flux of air is discharged through the safety valve.

Breather caps or double-valve breather caps with threaded connector

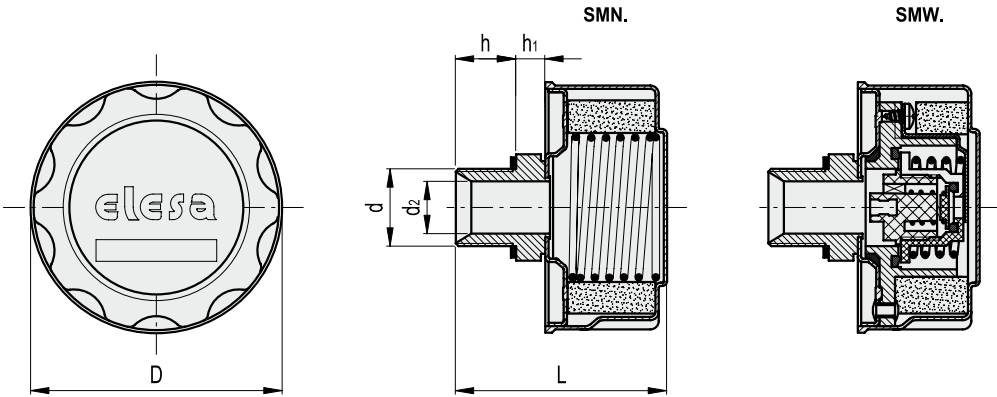


- **Material**
 - **Cover:** steel sheet, with chrome plating superficial treatment.
 - **Flange:** zinc-plated steel sheet.
 - **Threaded connector:** zinc-plated steel.
- **Flat packing ring**
NBR synthetic rubber.
- **Overpressure valve (only for SMW.)**
Technopolymer with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.350 bar (0.700 bar on request).
- **Suction valve (only for SMW.)**
Technopolymer sealing disk with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.030 bar.
- **Ring-shaped air filter**
Tech-foam 40 µ.
- **Filter setting spring (only for SMN.)**
Zinc-plated steel.
- **Standard executions**
 - **SMN.:** breather cap.
 - **SMW.:** double-valve breather cap.
- **Maximum continuous working temperature**
100°C.

Special executions on request
With dipstick for fluid level indication (only for SMW.).



Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
47	1.85
81	3.19



SMN.

metric units

Elesa Standards		Main dimensions						⚖
Code	Description	d	h	D	L	d2	h1	g
156833	SMN.46-1/4-F40	G 1/4	10	47	51	7	5	57
156883	SMN.80-3/4-F40	G 3/4	16	81	70	17	12	239

SMW.

metric units

Elesa Standards		Main dimensions						⚖
Code	Description	d	h	D	L	d2	h1	g
156983	SMW.80-3/4-F40-350mb	G 3/4	16	81	70	17	12	308

SMW. pressurised breather cap functioning in a hydraulic circuit

Features and applications

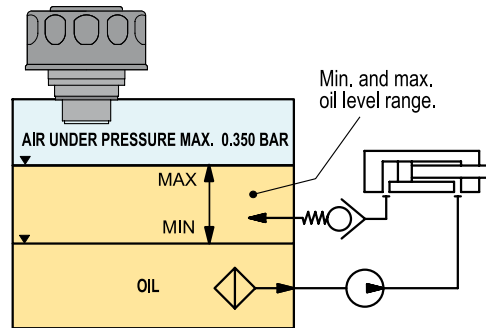
Double-valve breather cap SMW. creates a pressure plenum chamber right above the oil level within given limit conditions in order to avoid any reservoir deformation.

Advantages:

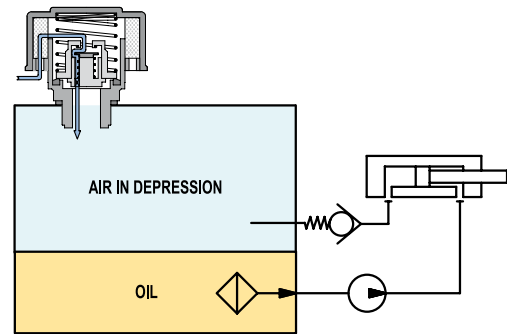
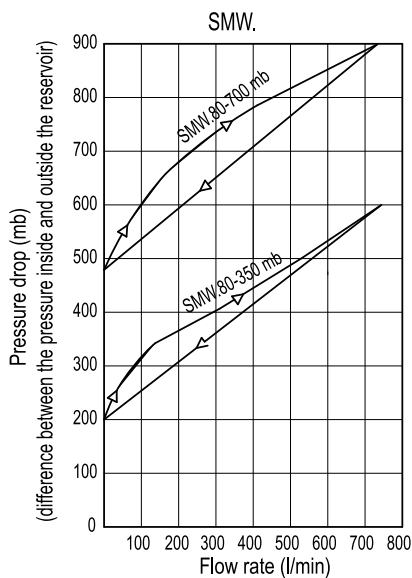
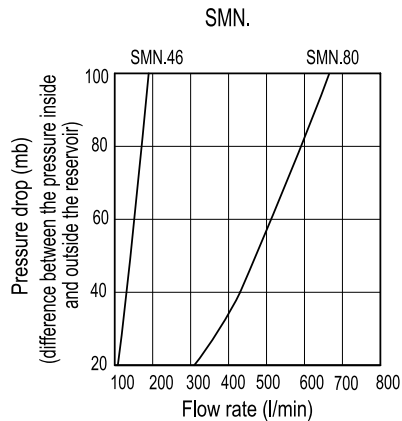
- it reduces reservoir air volume intake keeping clean fluid and filter;
- it improves suction pump action under working conditions reducing cavitation phenomenon;
- it prevents fluid leakage when the system is part of a mobile unit;
- it reduces foam in fluid.

Technical data

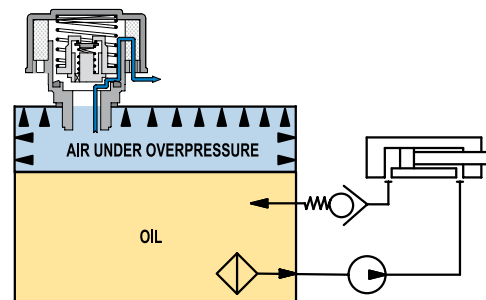
Air flow rate for the different executions of breather caps can be obtained from the diagram on the basis of the difference of air pressure inside and outside the reservoir.



Normal working conditions



When in the reservoir a depression under 0.030 bar is produced, a flux of air entering the reservoir through the suction valve takes place.



When in the reservoir an over pressure exceeding 0.350 (or 0.700) bar is produced, a flux of air is discharged through the safety valve.

SMN-BA ▪ SMW-BA

Breather caps or double-valve breather caps with bayonet assembly



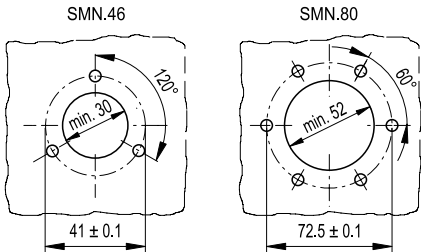
- **Material**
 - **Cover:** steel sheet, with chrome plating superficial treatment.
 - **Flange:** zinc-plated steel sheet.
 - **Bayonet and flange with bayonet:** zinc-plated steel sheet.
- **Flat packing rings**
 - **SMN.46:** two flat packing rings in rubber-impregnated cork and one in NBR synthetic rubber.
 - **SMN.80 SMW.80:** three flat packing rings in rubber-impregnated cork.
- **Overpressure valve (only for SMW-BA)**
Technopolymer with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.350 bar (0.700 bar on request).
- **Suction valve (only for SMW.)**
Technopolymer sealing disk with NBR synthetic rubber O-ring and stainless steel spring.
Set at around 0.030 bar.
- **Ring-shaped air filter**
Tech-foam 40 µ.
- **Filter setting spring (only for SMN-BA)**
Zinc-plated steel.
- **Filtration basket**
Electro zinc-plated steel, degree of filtration 800 µ.
- **Safety chain**
Brass.
- **Standard executions**
 - **SMN-BA:** breather cap.
 - **SMW-BA:** double-valve breather cap.
- **Assembly**
 - **SMN.46:** by means of three glossy zinc-plated steel screws with screwdriver slot head M5x12, supplied.
 - **SMN.80 SMW.80:** by means of six glossy zinc-plated steel screws with screwdriver slot head M5x12, supplied.
- **Maximum continuous working temperature**
100°C.

Special executions on request

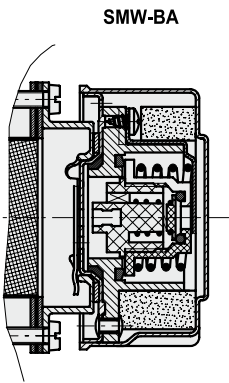
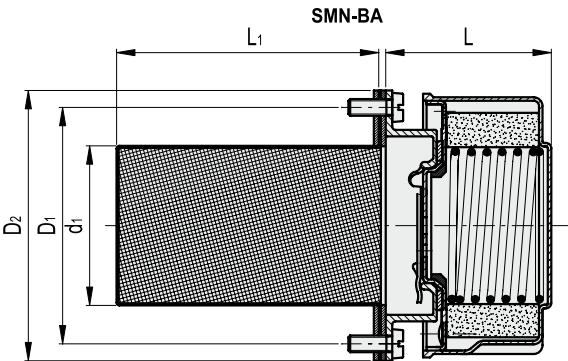
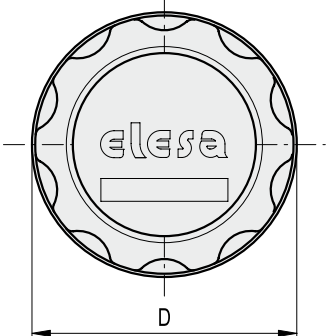
With dipstick for fluid level indication (only for SMW-BA).



Drilling templates



Conversion Table	
1 mm = 0.039 inch	
D	
mm	inch
47	1.85
81	3.19



SMN-BA

Elesa Standards		Main dimensions							ΔΔ
Code	Description	D	L	L1	D1	D2	d1	g	
156836	SMN.46-BA-F40	47	42	66	40	52	27	91	
156886	SMN.80-BA-F40	81	55	80	72	83	49	370	

SMW-BA

Elesa Standards		Main dimension							ΔΔ
Code	Description	D	L	L1	D1	D2	d1	g	
156986	SMW.80-BA-F40-350mb	81	55	80	72	83	49	410	

Features and applications

Double-valve breather caps SMW.BA with bayonet assembly creates a pressure plenum chamber right above the oil level within given limit conditions in order to avoid any reservoir deformation.

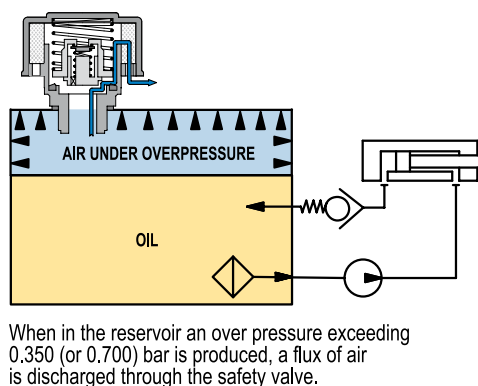
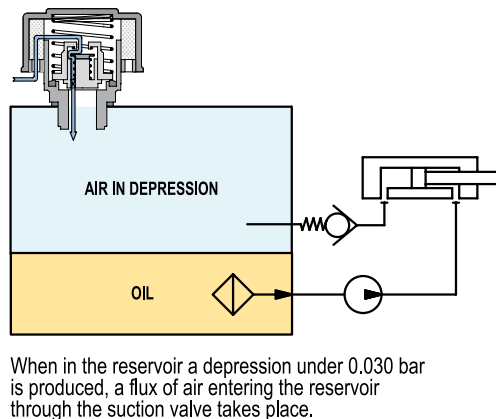
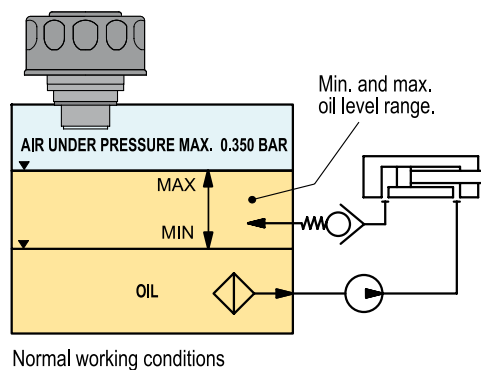
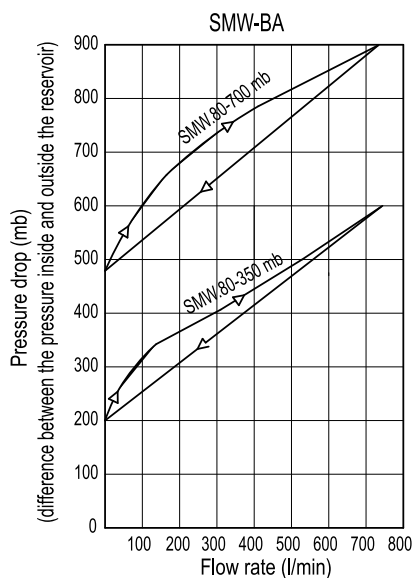
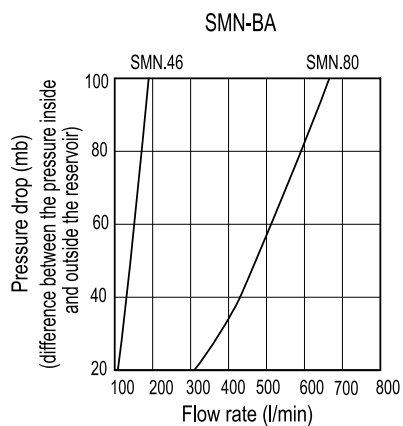
Advantages:

- it reduces reservoir air volume intake keeping clean fluid and filter;
- it improves suction pump action under working conditions reducing cavitation phenomenon;
- it prevents fluid leakage when the system is part of a mobile unit;
- it reduces foam in fluid.

Technical data

Air flow rate for the different executions of breather caps can be obtained from the diagram on the basis of the difference of air pressure inside and outside the reservoir. Tests carried out without filtration basket.

SMW. pressurised breather cap functioning in a hydraulic circuit



Flange for threaded cap



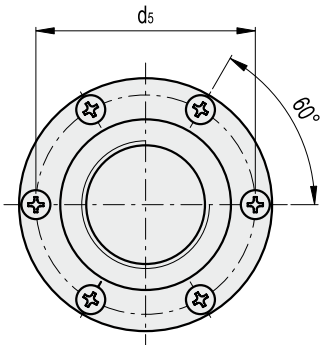
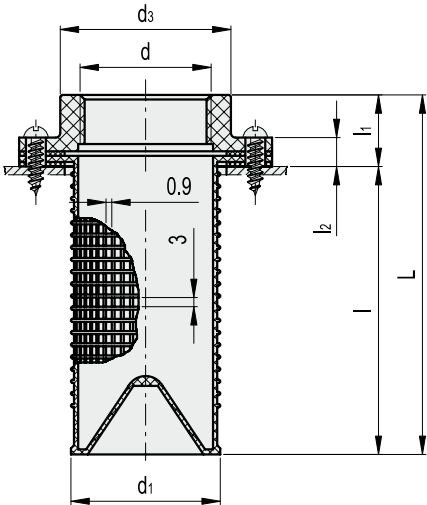
- **Material**
 - **Flange:** glass-fibre reinforced polyamide based (PA) technopolymer with threaded connector.
 - **Basket:** polypropylene based (PP) technopolymer.Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Flat gaskets**
Cork impregnated MGS based rubber.
- **Assembly**
By means of six zinc-plated steel self-tapping screws TC-N10 (Ø 4.8x19) UNI 6951-DIN 7971, supplied.

Special executions on request

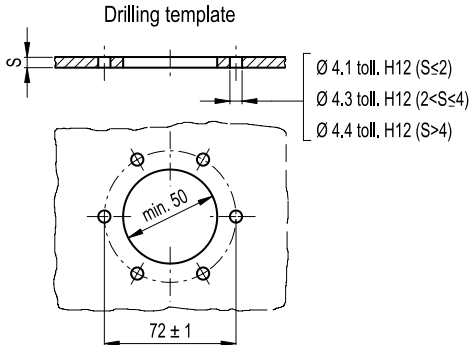
Threaded flange without basket (FRF).

Note

The breather cap to be coupled to the flange is not included in the supply and has to be ordered separately.
Breather caps type SFN. (see page 28), SFP. (see page 31), SFW. (see page 42) can be used depending on the customer's requirements.



Conversion Table	
1 mm = 0.039 inch	
▼	
d1	
mm	inch
49	1.93



metric units

Elesa Standards		Main dimensions									⚠
Code	Description	d	L	d1	d2	d3	d5	l	l1	l2	g
9101	FRF+C	G 1 1/4	118	49	83	56	72	94.5	23.5	9	105

Flange for bayonet cap



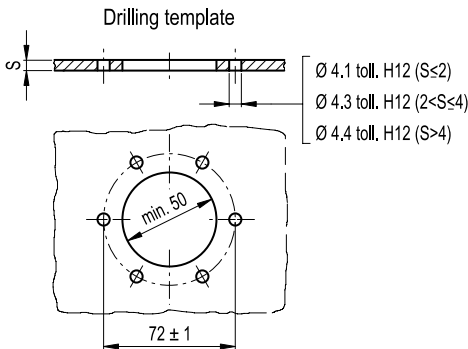
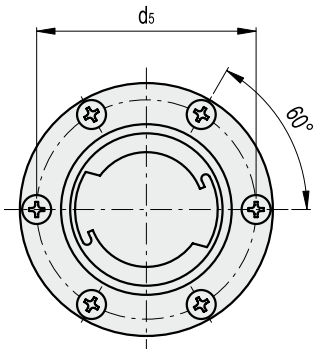
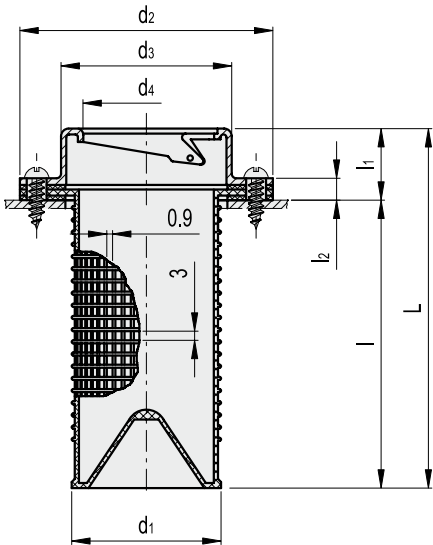
- Material
 - Flange: zinc-plated steel with bayonet connector.
 - Basket: polypropylene based (PP) technopolymer, black colour. Resistant to solvents, oils, greases and other chemical agents.
- Flat gaskets
 - Cork impregnated MGS based rubber.
- Assembly
 - By means of six zinc-plated steel self-tapping screws TC-N10 (Ø 4.8x19) UNI 6951-DIN 7971, supplied.

Special executions on request

Flange with bayonet connector without basket (FRB).

Note

The breather cap to be coupled to the flange is not included in the supply and has to be ordered separately.
Breather caps type SFN. (see page 28), SFP. (see page 31), SFW. (see page 42) can be used depending on the customer's requirements.



metric units

Elesa Standards		Main dimensions									⚖
Code	Description	d4	L	d1	d2	d3	d5	l	l1	l2	g
9201	FRB+C	39	114.5	49	83	58	72	94.5	20	7	125

Side mount
for threaded cap



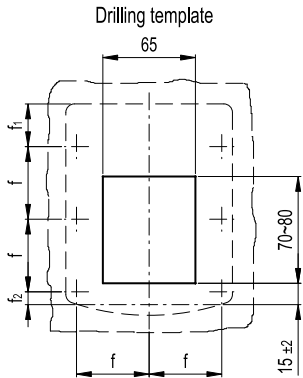
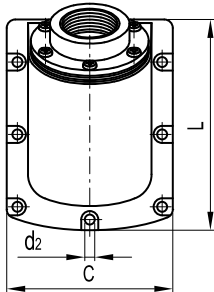
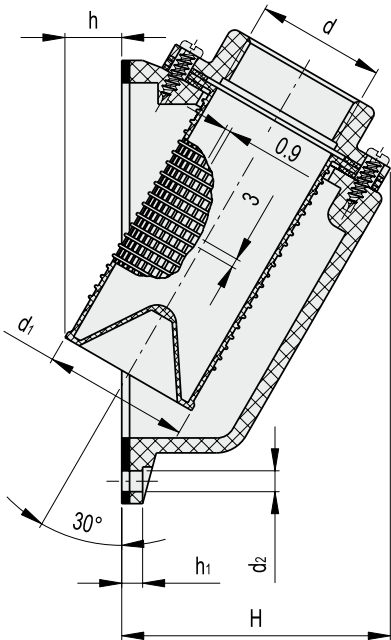
- **Material**
 - **Mount:** polyamide based (PA) technopolymer with NBR synthetic rubber packing ring.
 - **Flange:** glass-fibre reinforced polyamide based (PA) technopolymer, threaded connector with flat gasket in cork impregnated MGS based rubber.
 - **Basket:** polypropylene based (PP) technopolymer.Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Assembly**
Flange and basket are fitted to the mount by means of six zinc-plated steel self-tapping screws TC-N10 (Ø 4.8x19) UNI 6951-DIN 7971, supplied.
The mount is fitted to the reservoir by means of seven M6 screws and relative washers (not supplied).
Maximum recommended tightening torque: 8 Nm.

Special executions on request


Mount with threaded flange without basket (PLRF).

Note

The breather cap to be coupled to the flange is not included in the supply and has to be ordered separately.
Breather caps type SFN. (see page 28), SFP. (see page 31), SFW. (see page 42) can be used depending on customer's requirements.



metric units

Elesa Standards		Main dimensions											
Code	Description	d	L	C	H	d1	d2	h	h1	f	f1	f2	g
49411	PLRF+C	G 1¼	148.5	117	92	49	7	18	7	51	30	9	335

Side mount
for bayonet cap



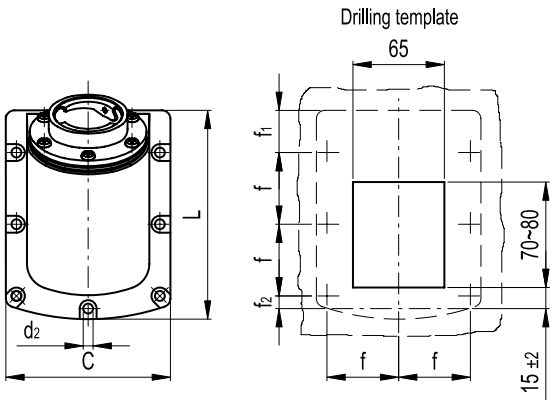
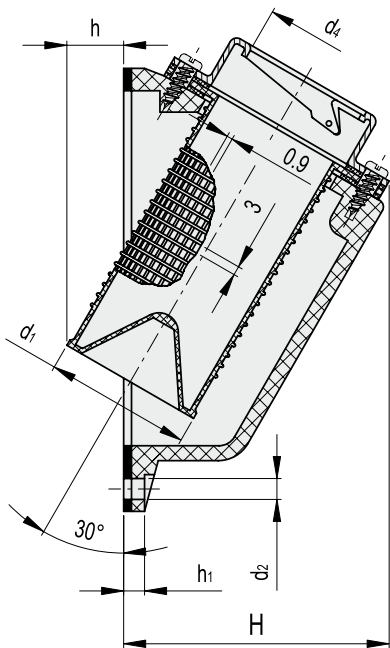
- **Material**
 - **Mount:** polyamide based (PA) technopolymer with NBR synthetic rubber packing ring.
 - **Flange:** zinc-plated steel, bayonet with flat gasket in cork impregnated MGS based rubber.
 - **Basket:** polypropylene based (PP) technopolymer.
- Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Assembly**
Flange and basket are fitted to the mount by means of six zinc-plated steel self-tapping screws TC-N10 (Ø 4.8x19) UNI 6951-DIN 7971, supplied.
The mount is fitted to the reservoir by means of seven M6 screws and relative washers (not supplied).
Maximum recommended tightening torque: 8 Nm.

Special executions on request

Mount with bayonet flange without basket (PLRB).

Note

The breather cap to be coupled to the flange is not included in the supply and has to be ordered separately.
Breather caps type SFN. (see page 28), SFP. (see page 31), SFW. (see page 42) can be used depending on customer's requirements.



metric units

Elesa Standards		Main dimensions											△
Code	Description	d4	L	C	H	d1	d2	h	h1	f	f1	f2	g
49401	PLRB+C	39	148.5	117	90	49	7	18	7	51	30	9	355

Oil level indicators



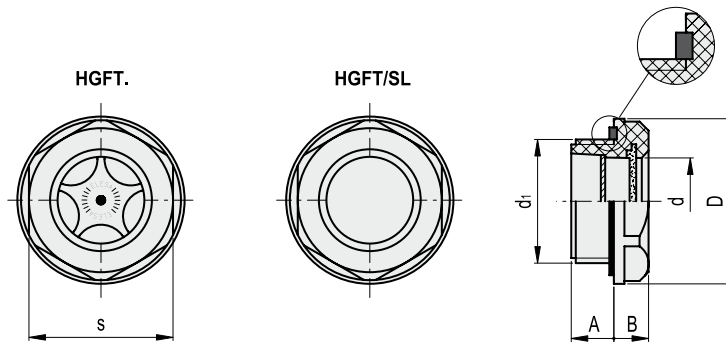
- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black or red, glossy finish (HGFT/SL only black colour).
- **Window**
Transparent polyamide based (PA-T/AR) technopolymer. Resistant to alcohol, solvents, oils with additives, greases, acids and alkali.
- **Flat packing ring**
NBR synthetic rubber.
- **Standard executions**
 - **HGFT.**: with matte anodised aluminium star-shaped contrast screen with red central level point.
 - **HGFT/SL**: without contrast screen.
- **Maximum continuous working temperature**
100°C at 3 bar pressure.

Accessories on request

Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Note

For use with other fluids with special additives, please contact ELESA Sales Department.



* Complete with colour index, example: 14441 HGFT.10-3/8-C9



HGFT.

metric units

Elesa Standards		Main dimensions							Tightening torque	△△
C9	C6									
Code		Description	d1	A	B	D	d	s	[Nm]	g
14441	14444	HGFT.10-3/8*	G 3/8	8	7	24	11	22	4÷8	4
14461	14464	HGFT.13-1/2*	G 1/2	10	8.5	28	14.5	24	6÷8	6
14481	14484	HGFT.16-3/4*	G 3/4	9.5	8.5	35	18	32	8÷10	10
14521	14524	HGFT.21-1*	G 1	11	9.5	42.5	23	38	10÷12	15
14541	14544	HGFT.25-1¼*	G 1¼	11	9	50	30	46	12÷15	30
14561	14564	HGFT.40-2*	G 2	12	11	68	40	62	12÷15	60

HGFT/SL

metric units

Elesa Standards		Main dimensions						Tightening torque	⚖
Code	Description	d1	A	B	D	d	s	[Nm]	g
14446	HGFT.10/SL-3/8	G 3/8	8	7	24	11	22	4+8	3
14466	HGFT.13/SL-1/2	G 1/2	10	8.5	28	14.5	24	6+8	5
14486	HGFT.16/SL-3/4	G 3/4	9.5	8.5	35	18	32	8+10	9
14526	HGFT.21/SL-1	G 1	11	9.5	42.5	23	38	10+12	14
14546	HGFT.25/SL-1¼	G 1¼	11	9	50	30	46	12+15	29
14566	HGFT.40/SL-2	G 2	12	11	68	40	62	12+15	59



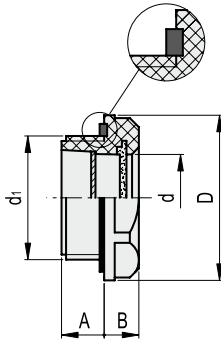
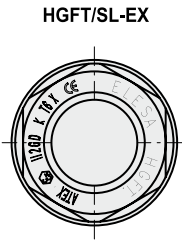
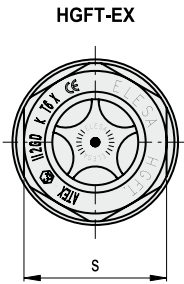
Oil level indicators



- Material**
 Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- Colour**
 Black, glossy finish.
- Window**
 Transparent polyamide based (PA-T/AR) technopolymer. Resistant to alcohol, solvents, oils with additives, greases, acids and alkali.
- Flat packing ring**
 NBR synthetic rubber.
- Standard executions**
 - HGFT-EX**: with matte anodised aluminium star-shaped contrast screen with red central level point.
 - HGFT/SL-EX**: without contrast screen.
- ATEX directive compliance**
 The level indicators of the HGFT-EX series comply with Health and Safety Requirements intended in 94/9/EC ATEX European Directive (explosive atmospheres) for equipments in Group II, category 2GD. Level indicators have “kX” protection degree and can therefore be mounted in equipments protected by means of “immersion in liquid”, without lowering protection degree.
 II 2 G D k T6 X, marked on the HGFT-EX level indicators, represents the identification according to ATEX directive.
 II: group of substances for which the product is suitable
 2: identification of the category
 G: identification of the type of explosive atmosphere (Gases or vapours)
 D: identification of the type of explosive atmosphere (Dust)
 kX: protection degree by means of immersion in liquid
 IIB: explosive gases group (only for HGFT.16)
 T6: temperature class
 Ambient and/or fluid temperature: -30 ÷ +80°C
 The declaration of conformity to European Directives of this product is available and it is part of the product itself.

Accessories on request
 Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Note
 For use with other fluids with special additives, please contact ELESa Sales Department.



HGFT-EX

metric units

Elesa Standards		Main dimensions						Tightening torque	
Code	Description	d1	A	B	D	d	s	[Nm]	g
14441-EX	HGFT.10-3/8-EX	G 3/8	8	7	24	11	22	4÷8	4
14461-EX	HGFT.13-1/2-EX	G 1/2	10	8.5	28	14.5	24	6÷8	6
14481-EX	HGFT.16-3/4-EX	G 3/4	9.5	8.5	35	18	32	8÷10	10

HGFT/SL-EX

metric units

Elesa Standards		Main dimensions						Tightening torque	
Code	Description	d1	A	B	D	d	s	[Nm]	g
14446-EX	HGFT.10/SL-3/8-EX	G 3/8	8	7	24	11	22	4÷8	3
14466-EX	HGFT.13/SL-1/2-EX	G 1/2	10	8.5	28	14.5	24	6÷8	5
14486-EX	HGFT.16/SL-3/4-EX	G 3/4	9.5	8.5	35	18	32	8÷10	9

Oil level indicators



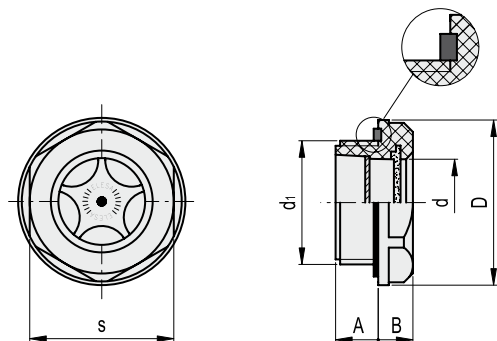
- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black or red, glossy finish (HGFT/SL only black colour).
- **Window**
Transparent polyamide based (PA-T/AR) technopolymer. Resistant to alcohol, solvents, oils with additives, greases, acids and alkali.
- **Flat packing ring**
NBR synthetic rubber.
- **Standard execution**
 - **HGFT.**: with matte anodised aluminium star-shaped contrast screen with red central level point.
- **Maximum continuous working temperature**
212°F (100°C) at 3 bar pressure.

Accessories on request

Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 0.20 (5 mm).

Note

For use with fluids containing special additives, please contact ELESA Sales Department.



american units

Elesa Standards		Main dimensions						Tightning torque	ΔΔ
Code	Description	d1	A	B	D	d	s	[ft·lb]	lbs
914461	HGFT.13-1/2 NPT	1/2 NPT	0.39	0.33	1.1	0.57	0.94	4+6	0.013
914481	HGFT.16-3/4 NPT	3/4 NPT	0.37	0.33	1.38	0.71	1.26	6+7	0.022
914521	HGFT.21-1 NPT	1 NPT	0.43	0.37	1.67	0.91	1.5	7+9	0.033

Oil level indicators



- **Material**
Aluminium, glossy finish.
- **Window**
Natural glass.
- **Flat packing ring**
NBR synthetic rubber.
- **Standard executions**
 - **GN 743-A**: with technopolymer (polysulphone) contrast screen.
 - **GN 743-B**: without contrast screen.
- **Maximum continuous working temperature**
100°C.

Accessories on request

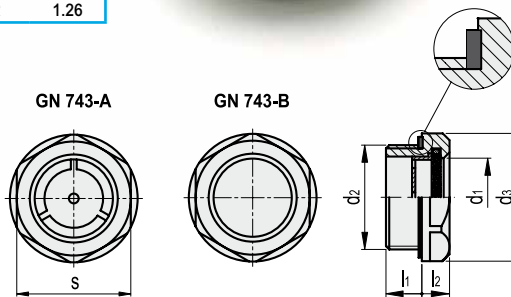
Brass nuts type GH. (see page 71), with Gas threadings, for fitting to reservoirs with wall thickness smaller than 5 mm.

Features and applications

GN 743 oil level indicators can be used on pressurised oil tanks. The seal between the aluminium body and the glass window is guaranteed by a packing ring in NBR synthetic rubber.

Conversion Table
1 mm = 0.039 inch

d1	
mm	inch
11	0.43
12	0.47
14	0.55
18	0.71
24	0.94
32	1.26



metric units

Elesa-Gantergriff		Main dimensions							ΔΔ
Code	Description	d1	d2	d3	l1	l2	s	g	
GN.37501	GN 743-11-M16x1.5-A	11	M16x1.5	22	8	7.5	20	8	
GN.37511	GN 743-14-M20x1.5-A	14	M20x1.5	26	8.5	7.5	23	10	
GN.37521	GN 743-18-M26x1.5-A	18	M26x1.5	32	9	8	30	18	
GN.37523	GN 743-18-M27x1.5-A	18	M27x1.5	32	9	8	30	18	
GN.37531	GN 743-24-M33x1.5-A	24	M33x1.5	40	11	8.5	36	26	
GN.37541	GN 743-32-M40x1.5-A	32	M40x1.5	50	12	8.5	46	39	
GN.37543	GN 743-32-M42x1.5-A	32	M42x1.5	50	12	9	46	43	
GN.37561	GN 743-11-G3/8-A	11	G 3/8	22	8	7.5	20	9	
GN.37563	GN 743-14-G1/2-A	14	G 1/2	26	8.5	7.5	23	11	
GN.37565	GN 743-18-G3/4-A	18	G 3/4	32	9	8	30	18	
GN.37567	GN 743-24-G1-A	24	G 1	40	11	8.5	36	26	
GN.37569	GN 743-32-G1½-A	32	G 1½	50	12	9	46	42	
GN.37571	GN 743-32-G1½-A	32	G 1½	60	13	9	55	45	
GN.37601	GN 743-11-M16x1.5-B	11	M16x1.5	22	8	7.5	20	8	
GN.37611	GN 743-14-M20x1.5-B	14	M20x1.5	26	8.5	7.5	23	10	
GN.37621	GN 743-18-M26x1.5-B	18	M26x1.5	32	9	8	30	18	
GN.37623	GN 743-18-M27x1.5-B	18	M27x1.5	32	9	8	30	18	
GN.37631	GN 743-24-M33x1.5-B	24	M33x1.5	40	11	8.5	36	26	
GN.37641	GN 743-32-M40x1.5-B	32	M40x1.5	50	12	8.5	46	39	
GN.37643	GN 743-32-M42x1.5-B	32	M42x1.5	50	12	9	46	43	
GN.37661	GN 743-11-G3/8-B	11	G 3/8	22	8	7.5	20	9	
GN.37663	GN 743-14-G1/2-B	14	G 1/2	26	8.5	7.5	23	11	
GN.37665	GN 743-18-G3/4-B	18	G 3/4	32	9	8	30	18	
GN.37667	GN 743-24-G1-B	24	G 1	40	11	8.5	36	26	
GN.37669	GN 743-32-G1½-B	32	G 1½	50	12	9	46	42	
GN.37573	GN 743-32-G1½-B	32	G1½	60	13	9	55	45	

Oil level indicators for high temperatures



- **Material**
Aluminium, glossy finish.
- **Window**
ESG safety glass.
- **Flat packing ring**
FKM type VITON®*
- **Standard executions**
 - **GN 743.1-A:** with technopolymer (polysulphone) contrast screen.
 - **GN 743.1-B:** without contrast screen.
- **Maximum continuous working temperature**
180°C.

Accessories on request

Brass nuts type GH. (see page 71), with Gas threadings, for fitting to reservoirs with wall thickness smaller than 5 mm.

Features and applications

GN 743.1 oil level indicators can be used on pressurised oil tanks.

The seal between the aluminium body and the glass window is guaranteed by a packing ring in FKM type VITON®.

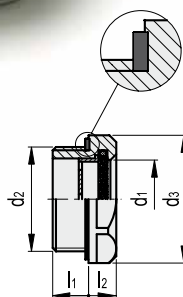
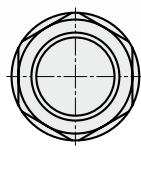
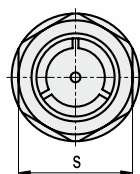
* Registered trademark by DuPont Dow Elastomers.

Conversion Table 1 mm = 0.039 inch	
d1	
mm	inch
11	0.43
12	0.47
14	0.55
18	0.71
24	0.94
32	1.26



GN 743.1-A

GN 743.1-B



metric units

Elesa-Gantergriff		Main dimensions							Δ
Code	Description	d1	d2	d3	l1	l2	s	g	
GN.37701	GN 743.1-11-M16x1.5-A	11	M16x1.5	22	8	7.5	20	8	
GN.37703	GN 743.1-14-M20x1.5-A	14	M20x1.5	26	8.5	7.5	23	10	
GN.37705	GN 743.1-18-M26x1.5-A	18	M26x1.5	32	9	8	30	18	
GN.37707	GN 743.1-18-M27x1.5-A	18	M27x1.5	32	9	8	30	18	
GN.37709	GN 743.1-24-M33x1.5-A	24	M33x1.5	40	11	8.5	36	26	
GN.37711	GN 743.1-32-M40x1.5-A	32	M40x1.5	50	12	9	46	39	
GN.37713	GN 743.1-32-M42x1.5-A	32	M42x1.5	50	12	9	46	43	
GN.37715	GN 743.1-11-G3/8-A	11	G 3/8	22	8	7.5	20	9	
GN.37717	GN 743.1-14-G1/2-A	14	G 1/2	26	8.5	7.5	23	11	
GN.37719	GN 743.1-18-G3/4-A	18	G 3/4	32	9	8	30	18	
GN.37721	GN 743.1-24-G1-A	24	G 1	40	11	8.5	36	26	
GN.37723	GN 743.1-32-G1½-A	32	G 1½	50	12	9	46	42	
GN.37725	GN 743.1-32-G1½-A	32	G 1½	60	13	9	55	45	
GN.37731	GN 743.1-11-M16x1.5-B	8	M16x1.5	22	8	7.5	20	8	
GN.37733	GN 743.1-14-M20x1.5-B	14	M20x1.5	26	8.5	7.5	23	10	
GN.37735	GN 743.1-18-M26x1.5-B	18	M26x1.5	32	9	8	30	18	
GN.37737	GN 743.1-18-M27x1.5-B	18	M27x1.5	32	9	8	30	18	
GN.37739	GN 743.1-24-M33x1.5-B	24	M33x1.5	40	11	8.5	36	26	
GN.37741	GN 743.1-32-M40x1.5-B	32	M40x1.5	50	12	8.5	46	39	
GN.37743	GN 743.1-32-M42x1.5-B	32	M42x1.5	50	12	9	46	43	
GN.37745	GN 743.1-11-G3/8-B	11	G 3/8	22	8	7.5	20	9	
GN.37747	GN 743.1-14-G1/2-B	14	G 1/2	26	8.5	7.5	23	11	
GN.37749	GN 743.1-18-G3/4-B	18	G 3/4	32	9	8	30	18	
GN.37751	GN 743.1-24-G1-B	24	G 1	40	11	8.5	36	26	
GN.37753	GN 743.1-32-G1½-B	32	G 1½	50	12	9	46	42	
GN.37727	GN 743.1-32-G1½-B	32	G 1½	60	13	9	55	45	

Oil level indicators



- **Material**
AISI 303 stainless steel.
- **Window**
Natural glass.
- **Flat packing ring**
NBR synthetic rubber.
- **Maximum continuous working temperature**
100°C.

Accessories on request

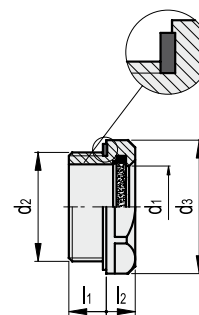
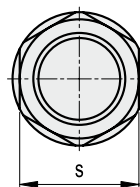
Brass nuts type GH., with Gas threadings, for fitting to reservoirs with wall thickness smaller than 5 mm.

Features and applications

GN 743.4 oil level indicators can be used on pressurised oil tanks (oil-proof resistance data available on request). The seal between the stainless steel body and the natural glass window is guaranteed by a packing ring in NBR synthetic rubber.



Conversion Table 1 mm = 0.039 inch	
d1	
mm	inch
11	0.43
14	0.55
18	0.71
24	0.94
32	1.26



metric units

Elesa-Gantergriff		Main dimensions							Δ
Code	Description	d1	d2	l1	l2	d3	s	g	
GN.37548	GN 743.4-11-M16x1.5-B	11	M16x1.5	8	7.5	22	20	19	
GN.37550	GN 743.4-14-M20x1.5-B	14	M20x1.5	8.5	7.5	26	23	23	
GN.37552	GN 743.4-18-M26x1.5-B	18	M26x1.5	9	8	32	30	41	
GN.37554	GN 743.4-24-M33x1.5-B	24	M33x1.5	11	8.5	40	36	64	
GN.37556	GN 743.4-32-M42x1.5-B	32	M42x1.5	12	9	50	46	102	
GN.37547	GN 743.4-11-G3/8-B	11	G 3/8	8	7.5	22	20	19	
GN.37549	GN 743.4-14-G1/2-B	14	G 1/2	8.5	7.5	26	23	23	
GN.37551	GN 743.4-18-G3/4-B	18	G 3/4	9	8	32	30	41	
GN.37553	GN 743.4-24-G1-B	24	G 1	11	8.5	40	36	64	
GN.37555	GN 743.4-32-G1½-B	32	G 1½	12	9	50	46	102	

Oil level indicators



- **Material**
Brass.
- **Window**
Natural glass.
- **Flat packing ring**
NBR synthetic rubber.
- **Standard executions**
 - **GN 743.2-A:** with technopolymer (polysulphone) contrast screen.
 - **GN 743.2-B:** without contrast screen.
- **Maximum continuous working temperature**
100°C.

Accessories on request

Brass nuts type GH. (see page 71), with Gas threadings, for fitting to reservoirs with wall thickness smaller than 5 mm.

Features and applications

GN 743.2 oil level indicators can be used on pressurised oil tanks.

The seal between the brass body and the glass window is guaranteed by a packing ring in NBR synthetic rubber.

Oil level indicators for high temperatures



- **Material**
Brass.
- **Window**
ESG safety glass.
- **Flat packing ring**
FKM type VITON®.
- **Standard executions**
 - **GN 743.3-A:** with technopolymer (polysulphone) contrast screen.
 - **GN 743.3-B:** without contrast screen.
- **Maximum continuous working temperature**
180°C.

Accessories on request

Brass nuts type GH. (see page 71), with Gas threadings, for fitting to reservoirs with wall thickness smaller than 5 mm.

Features and applications

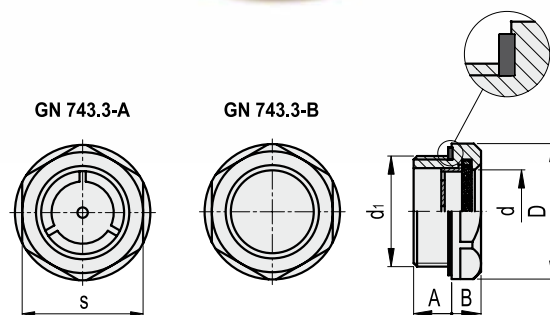
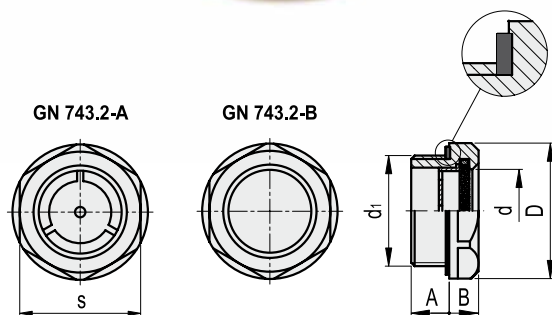
GN 743.3 oil level indicators can be used on pressurised oil tanks.

The seal between the brass body and the ESG glass window is guaranteed by a packing ring in FKM type VITON®.

* Registered trademark by DuPont Dow Elastomers.



Conversion Table	
1 mm = 0.039 inch	
d	
mm	inch
11	0.43
14	0.55
18	0.71
24	0.94



metric units

metric units

Elesa-Gantergriff		Main dimensions							ΔΔ
Code	Description	d	d1	A	B	D	s	g	
GN.37421	GN 743.2-11-M16x1.5-A	11	M16x1.5	8	7.5	22	20	19	
GN.37425	GN 743.2-14-M20x1.5-A	14	M20x1.5	8.5	7.5	26	23	23	
GN.37430	GN 743.2-18-M26x1.5-A	18	M26x1.5	9	8	32	30	44	
GN.37431	GN 743.2-18-M27x1.5-A	18	M27x1.5	9	8	32	30	46	
GN.37436	GN 743.2-24-M33x1.5-A	24	M33x1.5	11	8.5	40	36	70	
GN.37423	GN 743.2-11-G3/8-A	11	G 3/8	8	7.5	22	20	20	
GN.37427	GN 743.2-14-G1/2-A	14	G 1/2	8.5	7.5	26	23	23	
GN.37434	GN 743.2-18-G3/4-A	18	G 3/4	9	8	32	30	44	
GN.37438	GN 743.2-24-G1-A	24	G 1	11	8.5	40	36	69	
GN.37422	GN 743.2-11-M16x1.5-B	11	M16x1.5	8	7.5	22	20	19	
GN.37426	GN 743.2-14-M20x1.5-B	14	M20x1.5	8.5	7.5	26	23	23	
GN.37432	GN 743.2-18-M26x1.5-B	18	M26x1.5	9	8	32	30	44	
GN.37433	GN 743.2-18-M27x1.5-B	18	M27x1.5	9	8	32	30	46	
GN.37437	GN 743.2-24-M33x1.5-B	24	M33x1.5	11	8.5	40	36	70	
GN.37424	GN 743.2-11-G3/8-B	11	G 3/8	8	7.5	22	20	20	
GN.37428	GN 743.2-14-G1/2-B	14	G 1/2	8.5	7.5	26	23	23	
GN.37435	GN 743.2-18-G3/4-B	18	G 3/4	9	8	32	30	44	
GN.37439	GN 743.2-24-G1-B	24	G 1	11	8.5	40	36	69	

Elesa-Gantergriff		Main dimensions							ΔΔ
Code	Description	d	d1	A	B	D	s	g	
GN.37441	GN 743.3-11-M16x1.5-A	11	M16x1.5	8	7.5	22	20	19	
GN.37445	GN 743.3-14-M20x1.5-A	14	M20x1.5	8.5	7.5	26	23	23	
GN.37450	GN 743.3-18-M26x1.5-A	18	M26x1.5	9	8	32	30	44	
GN.37451	GN 743.3-18-M27x1.5-A	18	M27x1.5	9	8	32	30	46	
GN.37456	GN 743.3-24-M33x1.5-A	24	M33x1.5	11	8.5	40	36	70	
GN.37443	GN 743.3-11-G3/8-A	11	G 3/8	8	7.5	22	20	20	
GN.37447	GN 743.3-14-G1/2-A	14	G 1/2	8.5	7.5	26	23	23	
GN.37454	GN 743.3-18-G3/4-A	18	G 3/4	9	8	32	30	44	
GN.37458	GN 743.3-24-G1-A	24	G 1	11	8.5	40	36	69	
GN.37442	GN 743.3-11-M16x1.5-B	11	M16x1.5	8	7.5	22	20	19	
GN.37446	GN 743.3-14-M20x1.5-B	14	M20x1.5	8.5	7.5	26	23	23	
GN.37452	GN 743.3-18-M26x1.5-B	18	M26x1.5	9	8	32	30	44	
GN.37453	GN 743.3-18-M27x1.5-B	18	M27x1.5	9	8	32	30	46	
GN.37457	GN 743.3-24-M33x1.5-B	24	M33x1.5	11	8.5	40	36	70	
GN.37444	GN 743.3-11-G3/8-B	11	G 3/8	8	7.5	22	20	20	
GN.37448	GN 743.3-14-G1/2-B	14	G 1/2	8.5	7.5	26	23	23	
GN.37455	GN 743.3-18-G3/4-B	18	G 3/4	9	8	32	30	44	
GN.37459	GN 743.3-24-G1-B	24	G 1	11	8.5	40	36	69	

Oil level indicators



- **Material**
AISI 303 stainless steel.
- **Window**
ESG safety glass.
- **Flat packing ring**
FKM type VITON®*
- **Maximum continuous working temperature**
180°C.

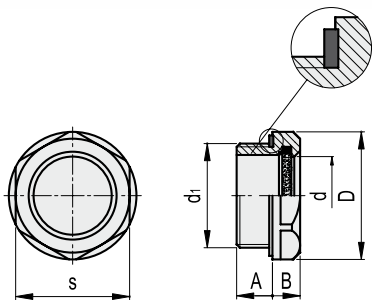
Accessories on request

Brass nuts type GH., with Gas threadings, for fitting to reservoirs with wall thickness smaller than 5 mm.

Features and applications

GN 743.5 oil level indicators can be used on pressurised oil tanks. The seal between the brass body and the ESG glass window is guaranteed by a packing ring in FKM type VITON®*

* Registered trademark by DuPont Dow Elastomers.



INOX metric units

Elesa-Gantergriff		Main dimensions							ΔΔ
Code	Description	d	d1	A	B	D	s	g	
GN.37462	GN 743.5-11-M16x1.5-B	11	M16x1.5	8	7.5	22	20	19	
GN.37466	GN 743.5-14-M20x1.5-B	14	M20x1.5	8.5	7.5	26	23	23	
GN.37470	GN 743.5-18-M26x1.5-B	18	M26x1.5	9	8	32	30	41	
GN.37474	GN 743.5-24-M33x1.5-B	24	M33x1.5	11	8.5	40	36	64	
GN.37478	GN 743.5-32-M42x1.5-B	32	M42x1.5	12	9	50	46	102	
GN.37464	GN 743.5-11-G3/8-B	11	G 3/8	8	7.5	22	20	19	
GN.37468	GN 743.5-14-G1/2-B	14	G 1/2	8.5	7.5	26	23	23	
GN.37472	GN 743.5-18-G3/4-B	18	G 3/4	9	8	32	30	41	
GN.37476	GN 743.5-24-G1-B	24	G 1	11	8.5	40	36	64	
GN.37479	GN 743.5-32-G1½-B	32	G 1½	12	9	50	46	102	



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Oil level indicators



- **Material**
Aluminium, glossy finish.
- **Window**
ESG safety glass.
- **Flat packing ring**
FKM type VITON®*
- **Maximum continuous working temperature**
150°C.

ATEX directive compliance

The level indicators of the GN 743.6 series comply with Health and Safety Requirements intended in 94/9/EC ATEX (Explosive Atmospheres) European Directive for equipments in Group II, category 2GD.

II 2 G/D TX: marked on the GN 743.6 level indicators, represents the identification according to the directive.

II: group of substances for which the product is suitable

2: identification of the area

G: potentially explosive atmosphere (gases or vapours)

D: potentially explosive atmosphere (dust)

Tx: see the "Instructions of use" supplied with every product.

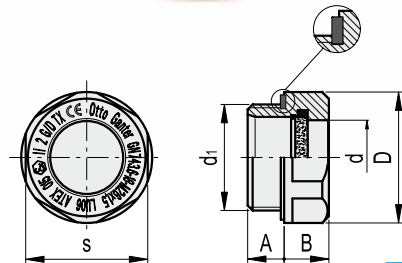
Every product codes will be supplied with declaration of conformity to European Directives.

GN 743.6 oil level indicators can be used on pressurised oil tanks. The seal between the aluminium body and the ESG glass window is guaranteed by a packing ring in FKM type VITON®*

Accessories on request

Brass nuts type GH., with Gas threadings, for fitting to reservoirs with wall thickness smaller than 5 mm.

* Registered trademark by DuPont Dow Elastomers.



metric units

Elesa-Gantergriff		Main dimensions							ΔΔ
Code	Description	d	d1	A	B	D	s	g	
GN.37762	GN 743.6-11-M16x1.5	11	M16x1.5	8	8	22	20	8	
GN.37767	GN 743.6-14-M20x1.5	14	M20x1.5	8.5	9	26	23	10	
GN.37772	GN 743.6-18-M26x1.5	18	M26x1.5	9	11	32	30	21	
GN.37773	GN 743.6-18-M27x1.5	18	M27x1.5	9	11	32	30	22	
GN.37761	GN 743.6-11-G3/8	11	G 3/8	8	8	22	20	8	
GN.37766	GN 743.6-14-G1/2	14	G 1/2	8.5	9	26	23	11	
GN.37771	GN 743.6-18-G3/4	18	G 3/4	9	11	32	30	21	

Oil level indicators

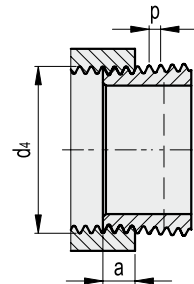
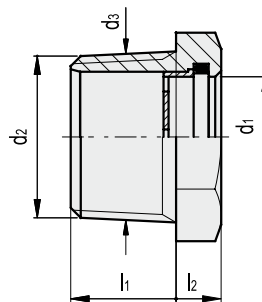
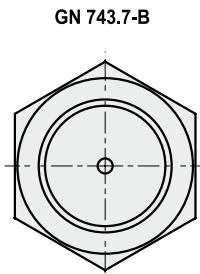
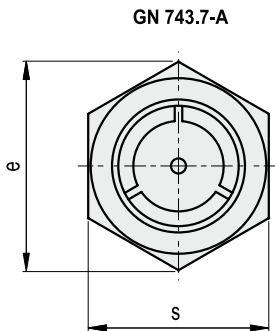


- **Material**
Brass.
- **Window**
Natural glass.
- **Standard executions**
 - **GN 743.7-A**: with technopolymer (polysulohone) contrast screen.
 - **GN 743.7-B**: without contrast screen.
- **Maximum continuous working temperature**
210°F (100°C).

Features and applications

GN 743.7 oil level indicators can be used on pressurised oil tanks. The seal between the brass body and the glass window is guaranteed by a packing ring in NBR synthetic rubber.

The coupling of the conical threading (d1) with a right female threading (d2) will be as more solid as the number of threads used will be higher. Generally to improve the tightness of this type of level indicators a sealing element like teflon ribbon is used.



GN 743.7-A

american units

Elesa-Gantergriff		Main dimensions										ΔΔ
Code	Description	d1	d2	a *	d3 at a	d4	e	l1	l2	s	p ***	lbs
GN.974370	GN 743.7-11-3/8 NPT-A	0.43	3/8 NPT	0.25	0.67	3/8 NPT	0.87	0.59	0.24	0.75	0.06	0.042
GN.974372	GN 743.7-14-1/2 NPT-A	0.55	1/2 NPT	0.32	0.83	1/2 NPT	1.08	0.63	0.28	0.94	0.07	0.073
GN.974374	GN 743.7-18-3/4 NPT-A	0.71	3/4 NPT	0.37	1.05	3/4 NPT	1.3	0.71	0.31	1.13	0.07	0.11
GN.974376	GN 743.7-24-1 NPT-A	0.94	1 NPT	0.41	1.33	1 NPT	1.63	0.83	0.35	1.37	0.09	0.205
GN.974378	GN 743.7-32-1 1/4 NPT-A	1.26	1 1/4 NPT	0.5	1.66	1 1/4 NPT	2.03	0.91	0.35	1.75	0.09	0.328

GN 743.7-B

GN.974371	GN 743.7-11-3/8 NPT-B	0.43	3/8 NPT	0.25	0.67	3/8 NPT	0.87	0.59	0.24	0.75	0.06	0.042
GN.974373	GN 743.7-14-1/2 NPT-B	0.55	1/2 NPT	0.32	0.83	1/2 NPT	1.08	0.63	0.28	0.94	0.07	0.073
GN.974375	GN 743.7-18-3/4 NPT-B	0.71	3/4 NPT	0.37	1.05	3/4 NPT	1.3	0.71	0.31	1.13	0.07	0.11
GN.974377	GN 743.7-24-1 NPT-B	0.94	1 NPT	0.41	1.33	1 NPT	1.63	0.83	0.35	1.37	0.09	0.205
GN.974379	GN 743.7-32-1 1/4 NPT-B	1.26	1 1/4 NPT	0.5	1.66	1 1/4 NPT	2.03	0.91	0.35	1.75	0.09	0.328

* datum plane

*** thread pitch

Oil level indicators
with conical threading



- **Material**
Brass.
- **Window**
Natural glass.
- **Standard executions**
 - **GN 743.7-A:** with technopolymer (polysulphone) contrast screen.
 - **GN 743.7-B:** without contrast screen.
- **Maximum continuous working temperature**
100°C.



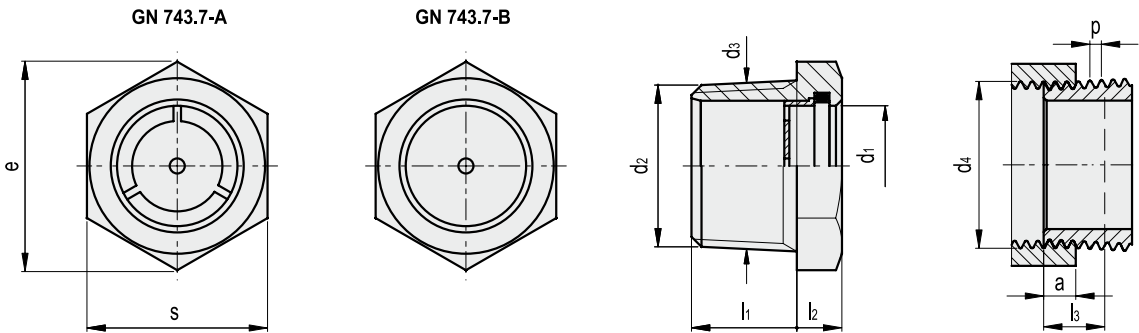
Features and applications

GN 743.7 oil level indicators can be used on pressurised oil tanks. The seal between the brass body and the glass window is guaranteed by a packing ring in NBR synthetic rubber. The coupling of the conical threading (d1) with a right female threading (d2) will be as more solid as the number of threads used will be higher. Generally to improve the tightness of this type of level indicators a sealing element like teflon ribbon is used.

Special executions on request

Indicators with NPT conical threading.

Conversion Table	
1 mm = 0.039 inch	
d1	
mm	inch
11	0.43
14	0.55
18	0.71
24	0.94
32	1.26



GN 743.7-A

metric units

Elesa-Gantergriff		Main dimensions											ΔΔ
Code	Description	d1	d2	a *	d3 at a	d4	e	l1	l2	l3 **	s	p ***	g
GN.37481	GN 743.7-11-R3/8-A	11	R 3/8	6.4	16.7	Rp 3/8	22	13	6	10.1	19	1.34	19
GN.37483	GN 743.7-14-R1/2-A	14	R 1/2	8.2	21	Rp 1/2	27.5	17	7	13.2	24	1.81	33
GN.37485	GN 743.7-18-R3/4-A	18	R 3/4	9.5	26.4	Rp 3/4	31	18	8	14.5	27	1.81	50
GN.37487	GN 743.7-24-R1-A	24	R 1	10.4	33.2	Rp 1	40.5	21	9	16.8	35	2.30	93
GN.37489	GN 743.7-32-R1¼-A	32	R 1¼	12.7	42	Rp 1¼	53	24	9	19.1	44.5	2.30	149

GN 743.7-B

GN.37482	GN 743.7-11-R3/8-B	11	R 3/8	6.4	16.7	Rp 3/8	22	13	6	10.1	19	1.34	19
GN.37484	GN 743.7-14-R1/2-B	14	R 1/2	8.2	21	Rp 1/2	27.5	17	7	13.2	24	1.81	33
GN.37486	GN 743.7-18-R3/4-B	18	R 3/4	9.5	26.4	Rp 3/4	31	18	8	14.5	27	1.81	50
GN.37488	GN 743.7-24-R1-B	24	R 1	10.4	33.2	Rp 1	40.5	21	9	16.8	35	2.30	93
GN.37490	GN 743.7-32-R1¼-B	32	R 1¼	12.7	42	Rp 1¼	53	24	9	19.1	44.5	2.30	149

* datum plane ** usable thread length *** thread pitch

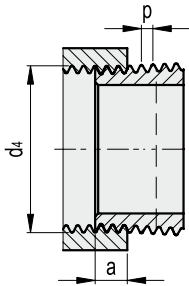
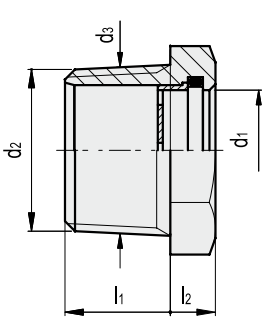
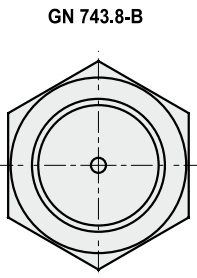
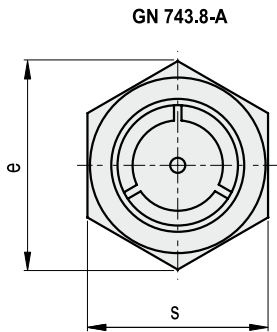


Oil level indicators



- **Material**
Brass.
- **Window**
ESG safety glass.
- **Standard executions**
 - **GN 743.8-A**: with technopolymer(polysulohone)contrast screen.
 - **GN 743.8-B**: without contrast screen.
- **Maximum continuous working temperature**
350°F (180°C).

Features and applications
GN 743.8 oil level indicators can be used on pressurised oil tanks. The seal between the brass body and the ESG glass window is guaranteed by an O-ring in FKM type VITON®.
The coupling of the conical threading (d1) with a right female threading (d2) will be as more solid as the number of threads used will be higher. Generally to improve the tightness of this type of level indicators a sealing element like teflon ribbon is used.
* Registered trademark by DuPont Dow Elastomers.



GN 743.8-A

american units

Elesa-Gantergriff		Main dimensions										ΔΔ
Code	Description	d1	d2	a *	d3 at a	d4	e	l1	l2	s	p ***	lbs
GN.974380	GN 743.8-11-3/8 NPT-A	0.43	3/8 NPT	0.25	0.67	3/8 NPT	0.87	0.59	0.24	0.75	0.06	0.042
GN.974382	GN 743.8-14-1/2 NPT-A	0.55	1/2 NPT	0.32	0.83	1/2 NPT	1.08	0.63	0.28	0.94	0.07	0.073
GN.974384	GN 743.8-18-3/4 NPT-A	0.71	3/4 NPT	0.37	1.05	3/4 NPT	1.3	0.71	0.31	1.13	0.07	0.11
GN.974386	GN 743.8-24-1 NPT-A	0.94	1 NPT	0.41	1.33	1 NPT	1.63	0.83	0.35	1.37	0.09	0.205
GN.974388	GN 743.8-32-1¼ NPT-A	1.26	1¼ NPT	0.5	1.66	1¼ NPT	2.03	0.91	0.35	1.75	0.09	0.328

GN 743.8-B

GN.974381	GN 743.8-11-3/8 NPT-B	0.43	3/8 NPT	0.25	0.67	3/8 NPT	0.87	0.59	0.24	0.75	0.06	0.042
GN.974383	GN 743.8-14-1/2 NPT-B	0.55	1/2 NPT	0.32	0.83	1/2 NPT	1.08	0.63	0.28	0.94	0.07	0.073
GN.974385	GN 743.8-18-3/4 NPT-B	0.71	3/4 NPT	0.37	1.05	3/4 NPT	1.3	0.71	0.31	1.13	0.07	0.11
GN.974387	GN 743.8-24-1 NPT-B	0.94	3/4 NPT	0.41	1.33	3/4 NPT	1.63	0.83	0.35	1.37	0.09	0.205
GN.974389	GN 743.8-32-1¼ NPT-B	1.26	1¼ NPT	0.5	1.66	1¼ NPT	2.03	0.91	0.35	1.75	0.09	0.328

* datum plane *** thread pitch

Oil level indicators
with conical threading
for high temperatures



- **Material**
Brass.
- **Window**
ESG safety glass.
- **Standard executions**
 - **GN 743.8-A**: with technopolymer (polysulphone) contrast screen.
 - **GN 743.8-B**: without contrast screen.
- **Maximum continuous working temperature**
180°C.



Features and applications

GN 743.8 oil level indicators can be used on pressurised oil tanks. The seal between the brass body and the ESG glass window is guaranteed by an O-ring in FKM type VITON®*.

The coupling of the conical threading (d1) with a right female threading (d2) will be as more solid as the number of threads used will be higher.

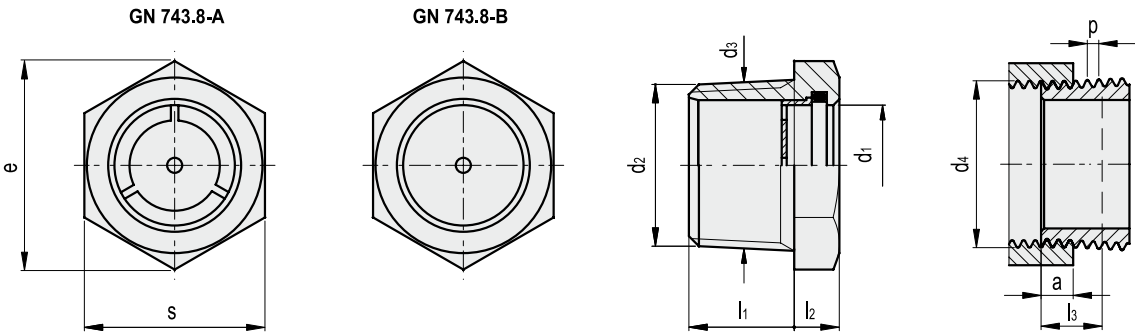
Generally to improve the tightness of this type of level indicators a sealing element like teflon ribbon is used.

* Registered trademark by DuPont Dow Elastomers.

Special executions on request

Indicators with NPT conical threading.

Conversion Table	
1 mm = 0.039 inch	
d1	
mm	inch
11	0.43
14	0.55
18	0.71
24	0.94
32	1.26



GN 743.8-A

metric units

Elesa-Gantergriff		Main dimensions											△△	
Code	Description	d1	d2	a *	d3 at a	d4	e	l1	l2	l3 **	s	p ***	g	
GN.37491	GN 743.8-11-R3/8-A	11	R 3/8	6.4	16.7	Rp 3/8	22	13	6	10.1	19	1.34	19	
GN.37493	GN 743.8-14-R1/2-A	14	R 1/2	8.2	21	Rp 1/2	27.5	17	7	13.2	24	1.81	33	
GN.37495	GN 743.8-18-R3/4-A	18	R 3/4	9.5	26.4	Rp 3/4	31	18	8	14.5	27	1.81	50	
GN.37497	GN 743.8-24-R1-A	24	R 1	10.4	33.2	Rp 1	40.5	21	9	16.8	35	2.30	93	
GN.37499	GN 743.8-32-R1¼-A	32	R 1¼	12.7	42	Rp 1¼	53	24	9	19.1	44.5	2.30	149	

GN 743.8-B

GN.37492	GN 743.8-11-R3/8-B	11	R 3/8	6.4	16.7	Rp 3/8	22	13	6	10.1	19	1.34	19	
GN.37494	GN 743.8-14-R1/2-B	14	R 1/2	8.2	21	Rp 1/2	27.5	17	7	13.2	24	1.81	33	
GN.37496	GN 743.8-18-R3/4-B	18	R 3/4	9.5	26.4	Rp 3/4	31	18	8	14.5	27	1.81	50	
GN.37498	GN 743.8-24-R1-B	24	R 1	10.4	33.2	Rp 1	40.5	21	9	16.8	35	2.30	93	
GN.37500	GN 743.8-32-R1¼-B	32	R 1¼	12.7	42	Rp 1¼	53	24	9	19.1	44.5	2.30	149	

* datum plane ** usable thread length *** thread pitch



Prismatic oil level indicators



- Material**
 Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- Colour**
 Black, glossy finish.
- Prismatic window**
 Transparent polyamide based (PA-T/AR) technopolymer. Resistant to alcohol, solvents, oils with additives, greases, acids and alkali.
 The window consists of a continuous series of prisms which provide a very clear and net reading of separation between the oil and the air (the oli level).
- Flat packing ring**
 NBR synthetic rubber.
- Maximum continuous working temperature**
 212°F (100°C) at 3 bar pressure.

Accessories on request

Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 0.20 (5 mm).

Note

For use with fluids containing special additives, please contact ELESa Sales Department.

Oil level indicators with prismatic window



- Material**
 Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- Colour**
 Black, glossy finish.
- Prismatic window**
 Transparent polyamide based (PA-T/AR) technopolymer. Resistant to alcohol, solvents, oils with additives, greases, acids and alkali.
 The window consists of a continuous series of prisms which provide a very clear and net reading of separation between the oil and the air (the oli level).
- Flat packing ring**
 NBR synthetic rubber.
- Maximum continuous working temperature**
 100°C at 3 bar pressure.

Accessories on request

Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Note

For use with other fluids with special additives, please contact ELESa Sales Department.



american units

Elesa Standards		Main dimensions							Tightening torque	⚠
Code	Description	d1	A	B	D	d	s		[ft·lb]	lbs
914462	HGFT.13/PR-1/2 NPT	1/2 NPT	0.39	0.33	1.1	0.57	0.94		4+6	0.011
914482	HGFT.16/PR-3/4 NPT	3/4 NPT	0.37	0.33	1.38	0.71	1.26		6+7	0.02
914522	HGFT.21/PR-1 NPT	1 NPT	0.43	0.37	1.67	0.91	1.5		7+9	0.031

metric units

Elesa Standards		Main dimensions							Tightening torque	⚠
Code	Description	d1	A	B	D	d	s		[Nm]	g
14462	HGFT.13/PR-1/2-C9	G 1/2	10	8.5	28	14.5	24		6+8	5
14482	HGFT.16/PR-3/4-C9	G 3/4	9.5	8.5	35	18	32		8+10	9
14522	HGFT.21/PR-1-C9	G 1	11	9.5	42.5	23	38		10+12	14
14542	HGFT.25/PR-1¼-C9	G 1¼	11	9	50	30	46		12+15	30

Oil level indicators
with prismatic window
for high temperatures



- Material**
Polyamide based (PA) technopolymer. Resistant to alcohol (methanol), solvents, oils with additives, greases, hydrocarbons and other chemical agents.
- Colour**
Black, glossy finish.
- Prismatic window**
Transparent sulphonic based technopolymer. Resistant to alcohol (methanol), solvents, oils with additives, greases, hydrocarbons, acids and alkali. The window consists of a continuous series of prisms which provide a very clear and net reading of separation between the oil and the air (the oli level).
- Flat packing ring**
FKM type VITON®.
- Maximum continuous working temperature**
140°C at 7 bar pressure.

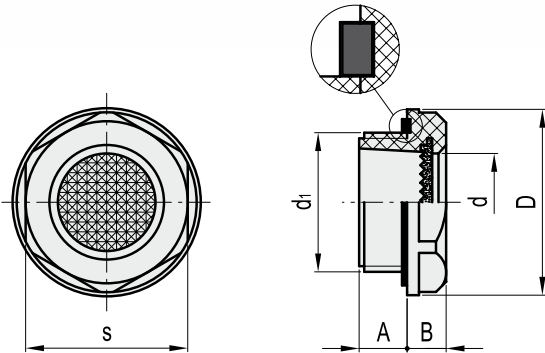
Accessories on request

Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Note

For use with other fluids with special additives, please contact ELESa Sales Department.

* Registered trademark by DuPont Dow Elastomers.



metric units

Elesa Standards		Main dimensions						Tightening torque	ΔΔ
Code	Description	d1	A	B	D	d	s	[Nm]	g
14463	HGFT.13/HT-PR-1/2	G 1/2	10	8.5	28	14.5	24	6÷8	5
14483	HGFT.16/HT-PR-3/4	G 3/4	9.5	8.5	35	18	32	8÷10	9
14523	HGFT.21/HT-PR-1	G 1	11	9.5	42.5	23	38	10÷12	14

Oil level indicators
with prismatic window



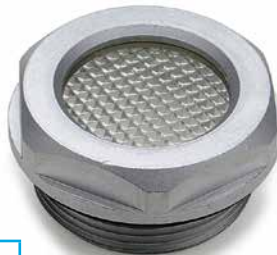
- Material**
Aluminium, glossy finish.
- Prismatic window**
Transparent polyamide based (PA-T/AR) technopolymer. Resistant to alcohol, solvents, oils with additives, greases, acids and alkali. The window consists of a continuous series of prisms, which provide a very clear and net reading of separation between the oil and the air (the oli level).
- Flat packing ring**
NBR synthetic rubber.
- Maximum continuous working temperature**
110°C.

Accessories on request

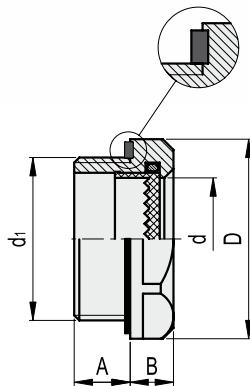
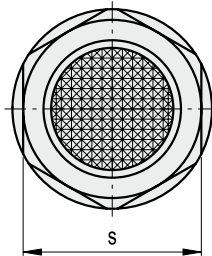
Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Features and applications

GN 744 oil level indicators can be used on pressurised oil tanks. The seal between the aluminium body and the technopolymer prismatic window is guaranteed by a packing ring in NBR synthetic rubber.



Conversion Table 1 mm = 0.039 inch	
d	
mm	inch
14	0.55
18	0.71
24	0.94



metric units

Elesa-Gantergriff		Main dimensions						ΔΔ
Code	Description	d1	A	B	D	d	s	g
GN.37781	GN 744-14-M20x1.5	M20x1.5	8.5	7.5	26	14	23	5
GN.37783	GN 744-18-M26x1.5	M26x1.5	9	8	32	18	30	15
GN.37785	GN 744-18-M27x1.5	M27x1.5	9	8	32	18	30	16
GN.37787	GN 744-24-M33x1.5	M33x1.5	11	8.5	40	24	36	22

metric units

Elesa-Gantergriff		Main dimensions						ΔΔ
Code	Description	d1	A	B	D	d	s	g
GN.37791	GN 744-14-G1/2"	G 1/2	8.5	7.5	26	14	23	8
GN.37793	GN 744-18-G3/4"	G 3/4	9	8	32	18	30	15
GN.37795	GN 744-24-G1"	G 1	11	8.5	40	24	36	23

Oil level indicators push-fit



- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Window**
Transparent polyamide based (PA-T/AR) technopolymer. Resistant to alcohol, solvents, oils with additives, greases, acids and alkali.
- **Contrast screen**
White lacquered aluminium with red level line.
- **Packing ring**
NBR synthetic rubber O-Ring.
- **Maximum continuous working temperature**
100°C.

Features and applications

The push-fit assembly is guaranteed by optimized ribbings. Sealing is guaranteed by the O-ring. HRT. oil level indicators push-fit are particularly suitable for assembly on reservoirs with limited pressure.

Assembly instructions

Chamfer hole 1x45° and grease slightly the outside surface of the O-ring to make assembly easier.

Note

For use with other fluids with special additives, please contact ELESA Sales Department.

Oil level indicators push-fit with oil temperature reading



- **Material**
Polyamide based (PA) technopolymer. Resistant to solvents, oils, greases and other chemical agents.
- **Colour**
Black, matte finish.
- **Window**
Transparent polyamide based (PA-T/AR) technopolymer. Resistant to alcohol, solvents, oils with additives, greases, acids and alkali.
- **Contrast screen with bimetallic thermometer**
Graduated scale up to 100°C to read oil temperature, even when oil level is at minimum, thanks to the conductivity of the aluminium contrast screen.
- **Packing ring**
NBR synthetic rubber O-Ring.
- **Maximum continuous working temperature**
100°C.

Features and applications

The push-fit assembly is guaranteed by optimized ribbings. Sealing is guaranteed by the O-ring. HRT-T oil level indicators push-fit are particularly suitable for assembly on reservoirs with limited pressure.

Assembly instructions

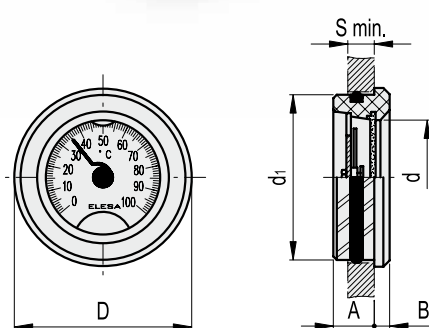
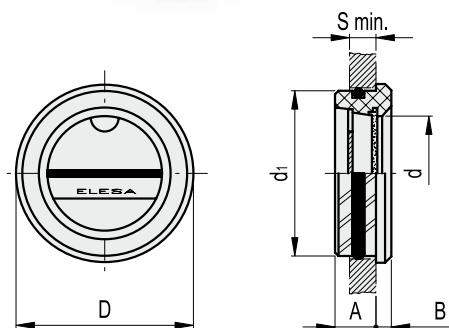
Chamfer hole 1x45° and grease slightly the outside surface of the O-ring to make assembly easier.

Note

For use with other fluids with special additives, please contact ELESA Sales Department.



Conversion Table	
1 mm = 0.039 inch	
d1	
mm	inch
26	1.02
32	1.26
38	1.50
60	2.36



metric units

Elesa Standards		Main dimensions						Mounting hole	△△
Code	Description	d1	A	B	D	d	S min.	d1 H11	g
10751	HRT.15-26	26	9	4.5	28	14.5	6	26	6
10756	HRT.20-32	32	10.5	4.5	36	18	8	32	10
10761	HRT.25-38	38	11	5	42	23	8	38	12
10766	HRT.40-60	60	11	5.5	64	40	9	60	29

metric units

Elesa Standards		Main dimensions						Mounting hole	△△
Code	Description	d1	A	B	D	d	S min.	d1 H11	g
10781	HRT.25/T-38	38	11	5	42	23	8	38	12
10786	HRT.40/T-60	60	11	5.5	64	40	9	60	29

Oil level indicators push-fit

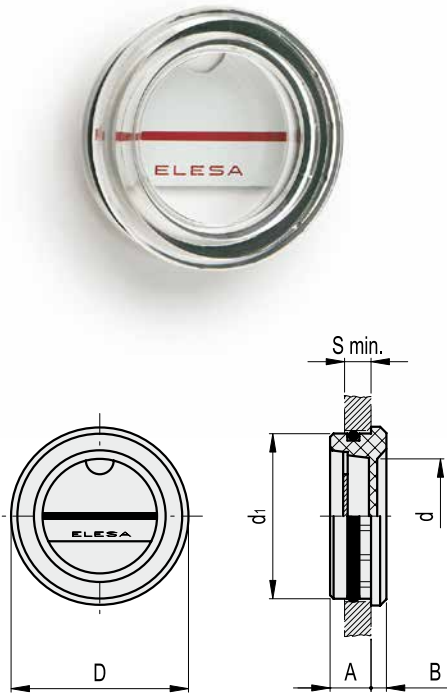


- **Material**
Transparent high mechanical resistance polycarbonate. Resistant to acids, alkali, greases and oils. Not suitable for use with oils with additives and solvents. Avoid contact with alcohol or detergents containing alcohol.
- **Contrast screen**
White lacquered aluminium with red level line.
- **Packing ring**
NBR synthetic rubber O-Ring.
- **Maximum continuous working temperature**
100°C.

Features and applications
The push-fit assembly is guaranteed by optimized ribbings. Sealing is guaranteed by the O-ring. HE. oil level indicators push-fit are particularly suitable for assembly on reservoirs with limited pressure.

Assembly instructions
Chamfer hole 1x45° and grease slightly the outside surface of the O-ring to make assembly easier.

Note
For use with other fluids with special additives, please contact ELESA Sales Department.



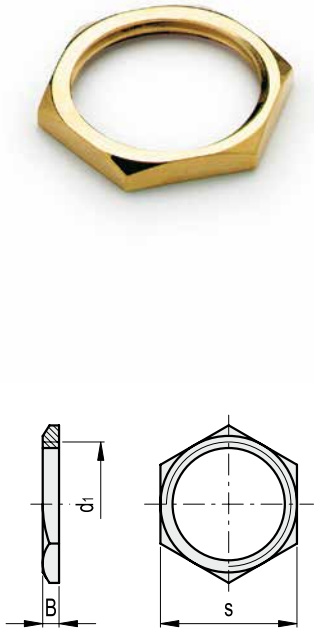
metric units

Elesa Standards		Main dimensions							Mounting hole	⚖
Code	Description	d1	A	B	D	d	S min.	d1 H11	g	
11401	HE.17	17	6.5	3	18	9	5	17	2	
11501	HE.20	20	8	3	21	12	6	20	3	
11601	HE.26	26	7.5	3.5	28	17	6	26	5	
11701	HE.30	30	8	4	32	20	7	30	7	
11801	HE.35	35	9	4	38	25	8	35	10	
11901	HE.40	40	10	4.5	43	28	9	40	13	
12001	HE.45	45	11	5.5	47	32	9	45	18	



Nuts

- **Material**
Brass.
- **Features and applications**
GH. nuts can be used for fitting the following indicators to reservoirs with thin walls (thickness smaller than 5 mm):
 - HGFT. page 58
 - HGFT-EX page 59
 - GN 743 page 60
 - GN 743.1 page 61
 - GN 743.2 page 62
 - GN 743.3 page 62
 - GN 743.5 page 63
 - GN 743.6 page 63
 - HGFT-PR page 68
 - HGFT-HT-PR page 69
 - GN 744 page 69
 - HFTX. page 72
 - HFTX.PR page 74
 - HCFE. page 74
 - HCFE/C page 75
 - HCFE-EX page 75



metric units

Elesa Standards		Main dimensions				⚖
Code	Description	d1	B	s	g	
14991	GH. 1/4	G 1/4	6	19	9	
15001	GH. 3/8	G 3/8	3	19	3	
15011	GH. 1/2	G 1/2	4	26	8	
15021	GH. 3/4	G 3/4	5	31	12	
15031	GH. 1	G 1	4.5	37	14	
15041	GH. 1¼	G 1¼	5	46	23	
15051	GH. 2	G 2	6	65	40	

Oil level indicators



- **Material**
Transparent polyamide based (PA-T) technopolymer. Resistant to solvents, oils with additives, greases, acids and alkali. Avoid contact with alcohol or detergents containing alcohol.
- **Star-shaped contrast screen**
Matte anodised aluminium with red central level point.
- **Flat packing ring**
NBR synthetic rubber.
- **Maximum continuous working temperature**
212°F (100°C).

Accessories on request
Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 0.20 (5 mm).

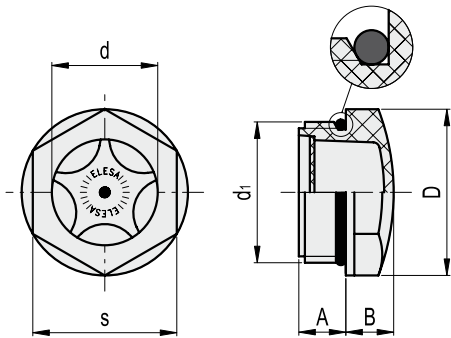
Features
The particular shape of the magnifying lens increases and improves visibility even from side positions.

Technical data
The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.

Note
For use with fluids containing special additives, please contact ELESA Sales Department.



HFTX/SAE



american units

Elesa Standards		Main dimensions						⚖
Code	Description	d1	A	B	D	d	s	lbs
913691	HFTX.3/4-16 SAE	3/4-16 UNF	0.59	0.31	1.02	0.51	0.87	0.011
913731	HFTX.1 1/16-12 SAE	1 1/16-12 UNF	0.59	0.39	1.38	0.75	1.18	0.022

Oil level indicators



- Material**
Transparent polyamide based (PA-T) technopolymer. Resistant to solvents, oils with additives, greases, acids and alkali. Avoid contact with alcohol or detergents containing alcohol.
- Star-shaped contrast screen**
Matte anodised aluminium with red central level point.
- Flat packing ring**
NBR synthetic rubber.
- Maximum continuous working temperature**
100°C.

Accessories on request

Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Features

The particular shape of the magnifying lens increases and improves visibility even from side positions.

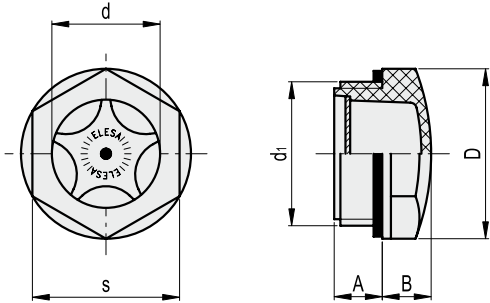
Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.

Note

For use with other fluids with special additives, please contact ELESA Sales Department.

Conversion Table	
1 mm = 0.039 inch	
d	
mm	inch
9	0.35
11	0.43
14	0.55
18	0.71
20	0.79
22	0.87
25	0.98
30	1.18



metric units

Elesa Standards		Main dimensions						Tightening torque	
Code	Description	d1	A	B	D	d	s	[Nm]	g
13661	HFTX.11-M16x1.5	M16x1.5	8	7	22	11	19	2÷3	4
13681	HFTX.14-M20x1.5	M20x1.5	9.5	8	26	14	22	8÷10	5
13701	HFTX.18-M25x1.5	M25x1.5	8	9	31.5	18	27	8÷10	8
13726	HFTX.21-M26x1.5	M26x1.5	13	9	31.5	18	27	8÷10	8
13711	HFTX.19-M27x1.5	M27x1.5	9	9	31.5	20	27	8÷10	8
13731	HFTX.22-M30x1.5	M30x1.5	9	10	35	22	30	8÷10	10
13751	HFTX.26-M35x1.5	M35x1.5	11	10	40	25	34	8÷10	13
13771	HFTX.31-M40x1.5	M40x1.5	11.5	13	47.5	30	40.5	8÷10	20

metric units

Elesa Standards		Main dimensions						Tightening torque	
Code	Description	d1	A	B	D	d	s	[Nm]	g
13651	HFTX.9-1/4	G 1/4	10	6	18	9	15	2÷3	3
13671	HFTX.12-3/8	G 3/8	7.5	7	22	11	19	3÷5	4
13691	HFTX.15-1/2	G 1/2	10.5	8	26	14	22	4÷6	5
13721	HFTX.20-3/4	G 3/4	10.5	9	31.5	20	27	6÷8	8
13741	HFTX.24-1	G 1	11	10	40	25	34	8÷10	12
13761	HFTX.30-1¼	G 1¼	11.5	13	47.5	30	40.5	8÷10	20

Oil level indicators with prismatic window



Material

Transparent polyamide based (PA-T) technopolymer. Resistant to solvents, oils with additives, greases, acids and alkali. Avoid contact with alcohol or detergents containing alcohol. The window consists of a continuous series of prisms which provide a very clear and net reading of separation between the oil and the air (the oil level).

Flat packing ring

NBR synthetic rubber.

Maximum continuous working temperature

100°C.

Accessories on request

Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.

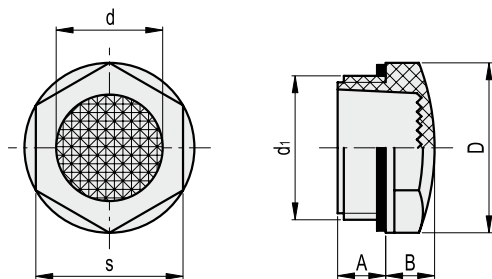
Note

For use with other fluids with special additives, please contact ELESA Sales Department.



Conversion Table
1 mm = 0.039 inch

d	
mm	inch
9	0.35
11	0.43
14	0.55
20	0.79
25	0.98



metric units

Elesa Standards		Main dimensions						Tightening torque	
Code	Description	d1	A	B	D	d	s	[Nm]	g
13652	HFTX.9/PR-1/4	G 1/4	10	6	18	9	15	2+3	3
13672	HFTX.12/PR-3/8	G 3/8	7.5	7	22	11	19	3+5	4
13692	HFTX.15/PR-1/2	G 1/2	10.5	8	26	14	22	4+6	5
13722	HFTX.20/PR-3/4	G 3/4	10.5	9	31.5	20	27	6+8	8
13742	HFTX.24/PR-1	G 1	11	10	40	25	34	8+10	12

Oil circulation sights



Material

Transparent polyamide based (PA-T) technopolymer. Resistant to solvents, oils with additives, greases, acids and alkali. Avoid contact with alcohol or detergents containing alcohol.

Flat packing ring

NBR synthetic rubber.

Maximum continuous working temperature

100°C.

Accessories on request

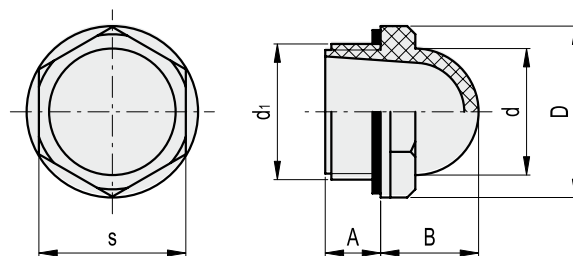
Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Technical data

The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.

Note

For use with other fluids with special additives, please contact ELESA Sales Department.



metric units

Elesa Standards		Main dimensions						Tightening torque	
Code	Description	d1	A	B	D	d	s	[Nm]	g
10851	HCFE.12-3/8	G 3/8	7.5	13	22.5	15	19	3+5	4
10901	HCFE.15-1/2	G 1/2	10.5	16	26	19	22	4+6	5
11001	HCFE.20-3/4	G 3/4	10.5	19.5	31.5	25	27	6+8	8
11101	HCFE.24-1	G 1	11	24	42	31	36	8+10	18
11111	HCFE.30-1 1/4	G 1 1/4	11.5	26.5	46.5	38	40.5	12+15	22



Oil circulation sights

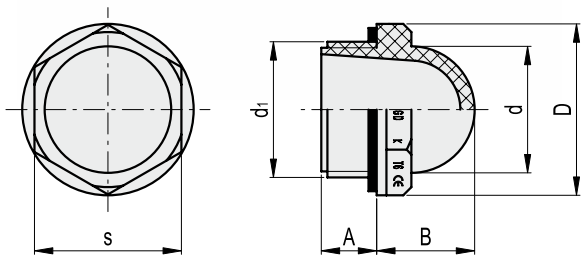


- **Material**
Transparent polyamide based (PA-T) technopolymer. Resistant to solvents, oils with additives, greases, acids and alkali. Avoid contact with alcohol or detergents containing alcohol.
- **Flat packing ring**
NBR synthetic rubber.
- **ATEX directive compliance**
The level indicators of the HCFE-EX series comply with Health and Safety Requirements intended in 94/9/EC ATEX European Directive (explosive atmospheres) for equipments in Group II, category 2GD. Level indicators have “kX” protection degree and can therefore be mounted in equipments protected by means of “immersion in liquid”, without lowering protection degree.
II 2 G D k T6, marked on the HCFE-EX level indicators, represents the identification according to ATEX directive.
II: group of substances for which the product is suitable
2: identification of the category
G: identification of the type of explosive atmosphere (Gases or vapours)
D: identification of the type of explosive atmosphere (Dust)
k: protection degree by means of immersion in liquid
IIB: explosive gases group (only for HCFE.20)
T6: temperature class
Ambient and/or fluid temperature: -30 ÷ +80°C
The declaration of conformity to European Directives of this product is available and it is part of the product itself.

Accessories on request
Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.

Technical data
The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.

Note
For use with other fluids with special additives, please contact ELESA Sales Department.



Elesa Standards		Main dimensions							Tightening torque	
Code	Description	d1	A	B	D	d	s	[Nm]	g	
10851-EX	HCFE.12-3/8-EX	G 3/8	7.5	13	22.5	15	19	3+5	4	
10901-EX	HCFE.15-1/2-EX	G 1/2	10.5	16	26	19	22	4+6	5	
11001-EX	HCFE.20-3/4-EX	G 3/4	10.5	19.5	31.5	25	27	6+8	8	

Oil circulation sights

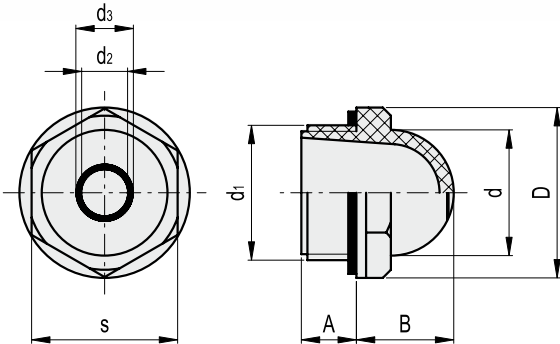


- **Material**
Transparent polyamide based (PA-T) technopolymer. Resistant to solvents, oils with additives, greases, acids and alkali. Avoid contact with alcohol or detergents containing alcohol.
- **Circle for oil level check**
Delimited by a small red coloured externally tampprinted circle.
Tampoprinting resistant to oils with additives, greases, alkali and white spirit; resistant to abrasions under normal working conditions. Avoid contact with solvents, alcohol or detergents containing alcohol.
- **Flat packing ring**
NBR synthetic rubber.
- **Maximum continuous working temperature**
100°C.

Accessories on request
Brass nut type GH. (see page 71) for fitting to reservoirs with wall thickness smaller than 5 mm.


Technical data
The tightening torque indicated in the table guarantees an optimal tightness, keeping the packing ring in the correct position.


Note
For use with other fluids with special additives, please contact ELESA Sales Department.



Elesa Standards		Main dimensions										Tightening torque	
Code	Description	d1	A	B	D	d	d2	d3	s	[Nm]	g		
10906	HCFE.15/C-1/2	G 1/2	10.5	16	26	19	6	7	22	4+6	5		
11006	HCFE.20/C-3/4	G 3/4	10.5	19.5	31.5	25	11	12	27	6+8	8		
11106	HCFE.24/C-1	G 1	11	24	42	31	14	15	36	8+10	18		

COLUMN LEVEL INDICATORS

Series	Features
HCZ. <i>page 78</i> 	With or without incorporated thermometer. With or without SUPER-technopolymer protection frame. Zinc-plated steel assembly screws. Hole centre distance screws 2.99, 5.00, 10.00 inch

Series	Features
HCX-VT <i>page 85</i> 	For applications requiring corrosion resistance with no need of using stainless steel screws. With or without incorporated thermometer. SUPER-technopolymer assembly screws. Hole centre distance screws 5.00, 10.00 inch

HCZ-VT <i>page 80</i> 	For applications requiring corrosion resistance with no need of using stainless steel screws. With or without SUPER-technopolymer protection frame. With or without incorporated thermometer. SUPER-technopolymer assembly screws. Hole centre distance screws 2.99, 5.00, 10.00 inch
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HCX-AR <i>page 86</i> 	For applications with fluids containing alcohol. With or without incorporated thermometer. Zinc-plated steel assembly screws. Hole centre distance screws 2.99, 5.00, 10.00 inch
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HCX. <i>page 82</i> 	With or without incorporated thermometer. Zinc-plated steel assembly screws. Hole centre distance screws 2.99, 5.00, 10.00 inch
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HCX-BW-SST <i>page 87</i> 	For applications with hot water. Without thermometer. Stainless steel assembly screws. Hole centre distance screws 2.99, 5.00, 10.00 inch
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HCX-P <i>page 83</i> 	Zinc-alloy protection frame. Zinc-plated steel assembly screws. Hole centre distance screws 5.00 inch
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HCX-LT <i>page 88</i> 	With float for indirect level reading. Zinc-plated steel assembly screws. Hole centre distance screws 10.00 inch
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HCX-SST <i>page 84</i> 	For applications requiring corrosion resistance. With or without incorporated thermometer. Stainless steel assembly screws. Hole centre distance screws 2.99, 5.00, 10.00 inch
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HCK. HCK-GL <i>page 90-91</i> 	Aluminium protection frame and transparent polycarbonate front protection. Zinc-plated steel assembly screws or stainless steel (HCK-GL). Hole centre distance screws 2.99, 5.00, 6.93, 10.00, 15.00, 20.00 inch HCK-GL: for applications with water/glycol-based solution.
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Series	Features	Series	Features
HCL. page 94	 <p>With protection frame made out of aluminium in natural colour. Zinc-plated steel assembly screws. Hole centre distance screws 11.81, 15.74, 19.68 inch</p>	HCX-E-ST page 102	 <p>With MIN level and MAX temperature electrical sensors. Zinc-plated steel assembly screws. Hole centre distance screws 5.00, 10.00 inch</p>
HCX-ST page 96	 <p>With MAX temperature electrical sensor. Zinc-plated steel assembly screws. Hole centre distance screws 5.00, 10.00 inch</p>	HCY-E-ST page 108	 <p>With MIN level and MAX temperature electrical sensors. Nickel-plated brass assembly screws. Hole centre distance screws 2.99, 5.00, 10.00 inch</p>
HCX-STL page 98	 <p>With electrical probe for indirect temperature reading by means of analogue signal. Zinc-plated steel assembly screws. Hole centre distance screws 5.00, 10.00 inch</p>	HCX-E-STL page 104	 <p>With MIN level electrical sensor and electrical probe for indirect temperature reading by means of analogue signal. Zinc-plated steel assembly screws. Hole centre distance screws 5.00, 10.00 inch</p>
HCX-E page 100	 <p>With MIN level electrical sensor. Zinc-plated steel assembly screws. Hole centre distance screws 5.00, 10.00 inch</p>	HFL-E page 110	 <p>Level electrical sensor with float. Assembly by means of flange or threaded coupler.</p>
HCY-E page 106	 <p>With MIN level electrical sensor. Nickel-plated brass assembly screws. Hole centre distance screws 2.99, 5.00, 10.00 inch</p>	HFLT-E page 112	 <p>Level electrical sensor with float. Assembly by means of flange or threaded coupler.</p>

Column level indicators



• Material

Transparent polyamide based (PA-T) technopolymer. Resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol and detergents containing alcohol.

• Screws and nuts

Zinc-plated steel.

• Packing rings

Step-shaped for the seal on the reservoir walls and NBR synthetic rubber O-ring screw underhead.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN) in the needed positions.

• Protection frame

Glass-fibre reinforced polyamide (PA) SUPER-technopolymer, black colour, matte finish. Resistant to solvents, oils, greases and other chemical agents. Supplied assembled, removable by a screwdriver.

• Standard executions

- **HCZ**: without thermometer and without protection frame.
- **HCZ/T**: with thermometer incorporated, without protection frame.
- **HCZ-P**: without thermometer, with protection frame.
- **HCZ/T-P**: with thermometer incorporated and protection frame.

• Assembly

- By means of the supplied set screws and nuts.
- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $Ra = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

- HCZ.127: with M10 screws and nuts.
- UV resistant transparent technopolymer indicators.

Features and performances

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions.

Level visibility and temperature reading magnified by lens effect.

All shocks are absorbed by the frame that transmits them directly onto the wall of the reservoir, since the indicator is suspended between the rubber packing rings.

The frame is equipped with a wide front opening and three slots on each side that, combined with the indicator made entirely of transparent material, guarantee maximum fluid level visibility even from side positions.

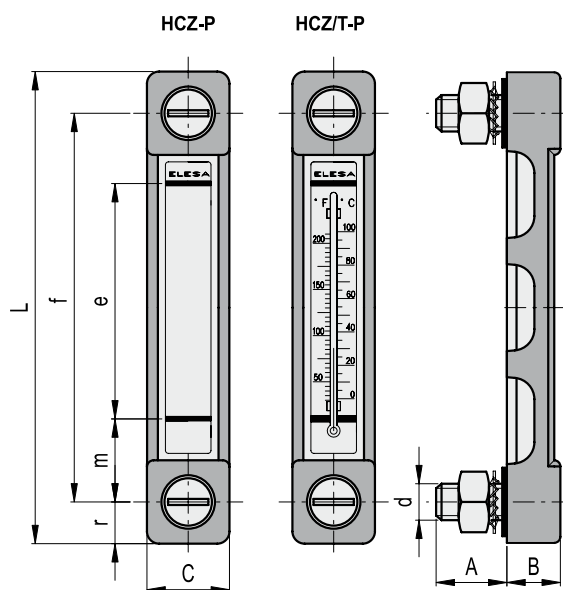
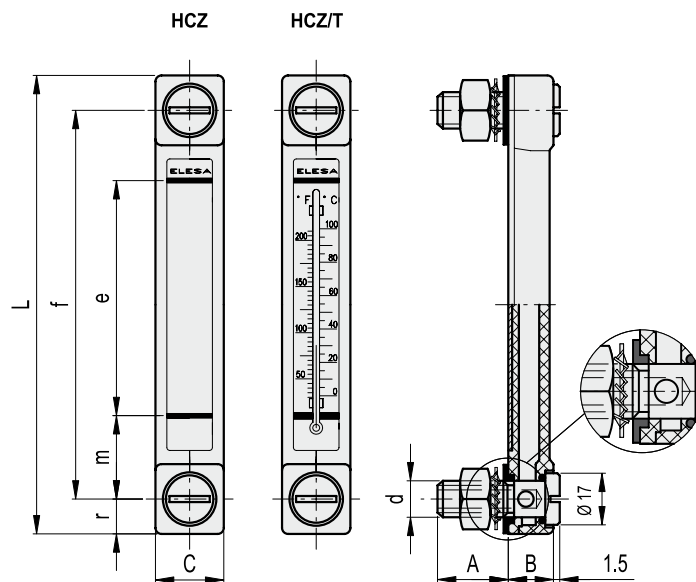
Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCZ.76 18 bar
- HCZ.127 18 bar
- HCZ.254 18 bar

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

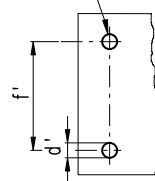




Conversion Table
1 mm = 0.039 inch

f	
mm	inch
76	2.99
127	5.00
254	10.00

Drilling template
Holes without burrs and chamfer



metric units

Elesa Standards		Main dimensions									Mounting holes		Thermometer scale		C #	ΔΔ
Code	Description	f	d	A	B	C	L	e	m	r	d'-0.2	f'±0.2	°C	°F	[Nm]	g
11382	HCZ.76	76	M10	22	15	22	99	40	18	11.5	10.5	76	-	-	12	90
11383	HCZ.76/T	76	M10	22	15	22	99	40	18	11.5	10.5	76	20+100	68+210	12	91
11385	HCZ.127	127	M12	22	15	22	150	80	23	11.5	12.5	127	-	-	12	120
11386	HCZ.127/T	127	M12	22	15	22	150	80	23	11.5	12.5	127	0+100	32+210	12	121
11388	HCZ.254	254	M12	22	15	22	279	160	23	12.5	12.5	254	-	-	6	150
11389	HCZ.254/T	254	M12	22	15	22	279	160	23	12.5	12.5	254	0+100	32+100	6	170
11392	HCZ.76-P	76	M10	22	17.5	27	105	40	18	14.5	10.5	76	-	-	12	101
11393	HCZ.76/T-P	76	M10	22	17.5	27	105	40	18	14.5	10.5	76	20+100	68+210	12	102
11395	HCZ.127-P	127	M12	22	17.5	27	156	80	23	14.5	12.5	127	-	-	12	138
11396	HCZ.127/T-P	127	M12	22	17.5	27	156	80	23	14.5	12.5	127	0+100	32+210	12	139
11398	HCZ.254-P	254	M12	22	17.5	27	285	160	23	15.5	12.5	254	-	-	6	150
11399	HCZ.254/T-P	254	M12	22	17.5	27	285	160	23	15.5	12.5	254	0+100	32+210	6	150

Maximum tightening torque.

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Column level indicators technopolymer assembly screws

PA-T

PA

+90°
-30°

RoHS

• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters.

Avoid contact with alcohol or detergents containing alcohol.

• Screws

Glass-fibre reinforced SUPER-polyamide based (PA) technopolymer, lightweight and high mechanical strength.

Anticorrosive material: suitable even in the presence of liquid or humidity. Resistant to several washing cycles with solvents and detergents, for this reason it is suitable for applications as in the pharmaceutical or food industry.

• Nuts and washers

AISI 304 stainless steel.

• Packing rings

Step-shaped for the seal on the reservoir walls and NBR synthetic rubber O-ring screw underhead.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN), in the required position.

• Protection frame

Glass-fibre reinforced polyamide (PA) SUPER-technopolymer, black colour, matte finish. Resistant to solvents, oils, greases and other chemical agents. Supplied assembled, removable by a screwdriver.

• Standard executions

- **HCZ-VT**: without thermometer and without protection frame.
- **HCZ/T-VT**: with thermometer incorporated, without protection frame.
- **HCZ-P-VT**: without thermometer, with protection frame.
- **HCZ/T-P-VT**: with thermometer incorporated and protection frame.

• Assembly

- By means of the supplied set screws and nuts.
- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the application surface of the packing ring $Ra = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

UV resistant transparent technopolymer indicators.

Features and performances

Thanks to the SUPER-technopolymer screws, HCZ-VT column level indicator can be used in corrosion resistance applications where stainless steel is not necessary.

The special slotted head of the SUPER-technopolymer screws is especially designed to reach an optimum tightening of the packing rings by applying an adequate tightening torque (ELESA patent) thus avoiding unnecessary stress to the screws.

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Level visibility and temperature reading magnified by lens effect.

Special side openings provide maximum fluid level visibility even from side positions.

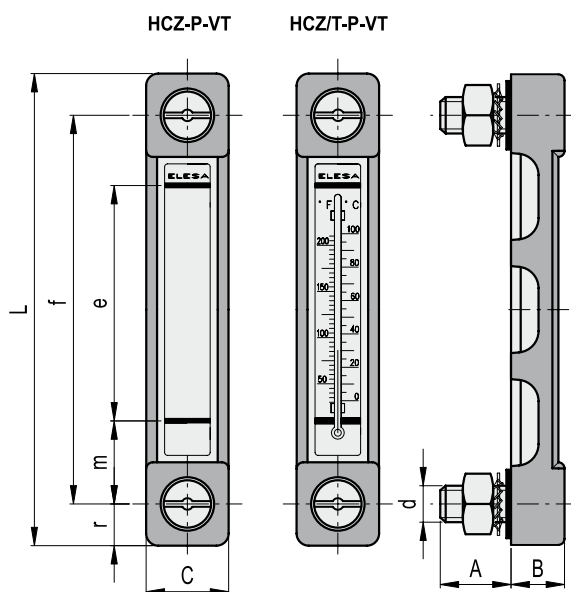
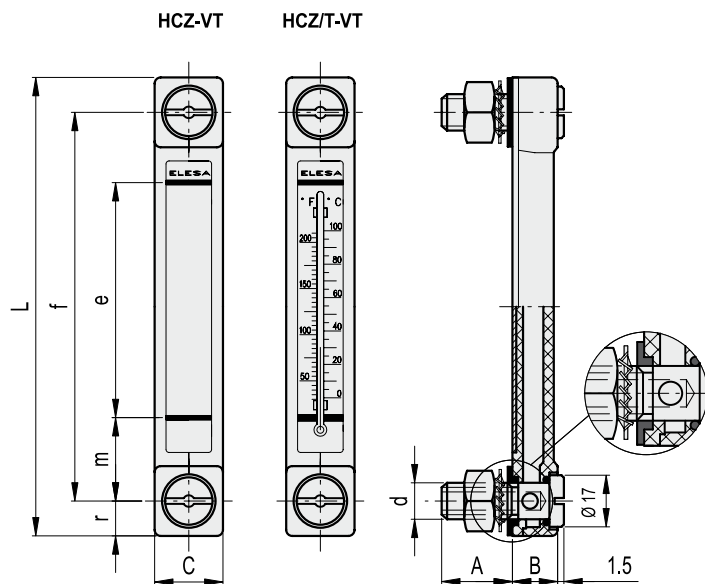
The protection frame is suitable for further increasing the resistance to shocks. These shocks are absorbed by the protection frame that transmits them directly onto the wall of the reservoir.

Technical data

Considering the SUPER-technopolymer screws, the maximum working pressure cannot be higher than 5 bar at 20°C and 2 bar at 90°C.

For higher pressure values use HCZ-SST with stainless steel screws.

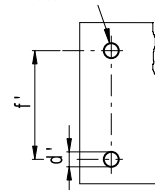




Conversion Table
1 mm = 0.039 inch

f	
mm	inch
76	2.99
127	5.00
254	10.00

Drilling template
Holes without burrs and chamfer



metric units

Elesa Standards		Main dimensions									Mounting holes		Thermometer scale		C #	ΔΔ
Code	Description	f	d	A	B	C	L	e	m	r	d'-0.2	f±0.2	°C	°F	[Nm]	g
111382	HCZ.76-VT-M12	76	M12	23.5	15	22	99	40	18	11.5	12.5	76	-	-	6	67
111383	HCZ.76/T-VT-M12	76	M12	23.5	15	22	99	40	18	11.5	12.5	76	20+100	68+210	6	68
111385	HCZ.127-VT-M12	127	M12	23.5	15	22	150	80	23	11.5	12.5	127	-	-	6	78
111386	HCZ.127/T-VT-M12	127	M12	23.5	15	22	150	80	23	11.5	12.5	127	0+100	32+100	6	79
111388	HCZ.254-VT-M12	254	M12	23.5	15	22	279	160	23	12.5	12.5	254	-	-	6	110
111389	HCZ.254/T-VT-M12	254	M12	23.5	15	22	279	160	23	12.5	12.5	254	0+100	32+100	6	111
111392	HCZ.76-P-VT-M12	76	M12	23.5	17.5	27	105	40	18	14.5	12.5	76	-	-	6	85
111393	HCZ.76/T-P-VT-M12	76	M12	23.5	17.5	27	105	40	18	14.5	12.5	76	20+100	68+210	6	86
111395	HCZ.127-P-VT-M12	127	M12	23.5	17.5	27	156	80	23	14.5	12.5	127	-	-	6	104
111396	HCZ.127/T-P-VT-M12	127	M12	23.5	17.5	27	156	80	23	14.5	12.5	127	0+100	32+100	6	105
111398	HCZ.254-P-VT-M12	254	M12	23.5	17.5	27	285	160	23	15.5	12.5	254	-	-	6	169
111399	HCZ.254/T-P-VT-M12	254	M12	23.5	17.5	27	285	160	23	15.5	12.5	254	0+100	32+100	6	170

Maximum tightening torque.

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Column level indicators



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.

• Screws, nuts and washers

Zinc-plated steel.

• Packing rings

NBR synthetic rubber O-Ring.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures. It can be removed before installation to fit marks and words (for example MAX-MIN), in the needed positions.

• Standard executions

- **HCX:** without thermometer.
- **HCX/T:** with incorporated thermometer.

• Assembly

- By means of the supplied set screws and nuts.
- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.
- By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

UV resistant transparent technopolymer indicators.

Features and performances

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions.

Level visibility and temperature reading magnified by lens effect.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCX.76 18 bar
- HCX.127 18 bar
- HCX.254 12 bar

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Other standard executions

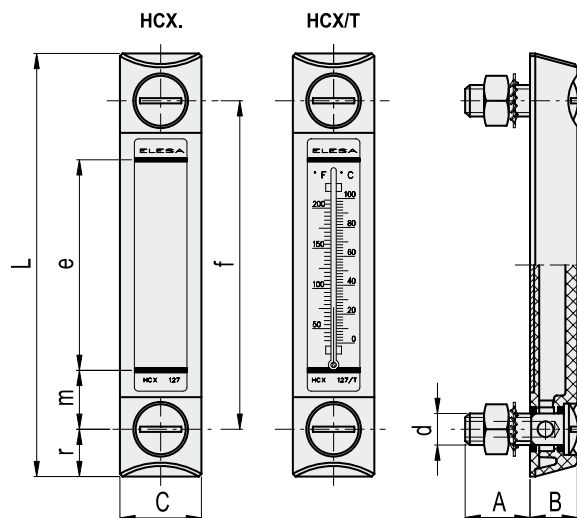
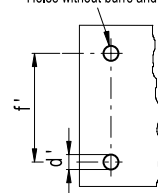
- HCX-AR (see page 86) for use with fluids containing alcohol.
- HCX-BW-SST (see page 87) for use with hot water.



Conversion Table
1 mm = 0.039 inch

mm	inch
76	2.99
127	5.00
254	10.00

Drilling template
Holes without burrs and chamfer



metric units

Elesa Standards		Main dimensions									Mounting holes		Thermometer scale		C #	ΔΔ
Code	Description	f	d	A	B	C	L	e	m	r	d'±0.2	f'±0.2	°C	°F	[Nm]	g
11341	HCX.76-M10	76	M10	22	16	27	107	40	18	15.5	10.5	76	-	-	12	87
11346	HCX.76/T-M10	76	M10	22	16	27	107	40	18	15.5	10.5	76	20÷100	68÷210	12	87
11349	HCX.127-M10	127	M10	23	18	31	161	80	23	17	10.5	127	-	-	12	138
11354	HCX.127/T-M10	127	M10	23	18	31	161	80	23	17	10.5	127	0÷100	32÷210	12	138
11351	HCX.127-M12	127	M12	23	18	31	161	80	23	17	12.5	127	-	-	12	138
11356	HCX.127/T-M12	127	M12	23	18	31	161	80	23	17	12.5	127	0÷100	32÷210	12	138
11361	HCX.254-M12	254	M12	21	18	35	291	203	26	18.5	12.5	254	-	-	10	185
11366	HCX.254/T-M12	254	M12	21	18	35	291	203	26	18.5	12.5	254	0÷100	32÷210	10	185

Column level indicators
with protection frame



- Material**
Transparent polyamide based (PA-T) technopolymer. High resistance to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters.
Avoid contact with alcohol or detergents containing alcohol.
- Protection frame**
Zinc-alloy, sandblasted and treated finish.
- Screws, nuts and washers**
Zinc-plated steel.
- Packing rings**
Step-shaped and NBR synthetic rubber O-ring.
- Contrast screen**
White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures. It can be removed before installation to fit marks and words (for example MAX-MIN), in the needed positions.
- Standard executions**
 - HCX-P: without thermometer.
 - HCX/T-P: with incorporated thermometer.
- Assembly**
 - By means of the supplied set screws and nuts.
 - By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.
 - By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.
- Maximum continuous working temperature**
90°C (with oil).

Special executions on request

- Level indicators for use with fluids containing alcohol or with hot water.
- UV resistant transparent technopolymer indicators.
- Protection frame with HCX-SST (see page 84), HCX-BW-SST (see page 87), HCX-AR (see page 86) indicators.

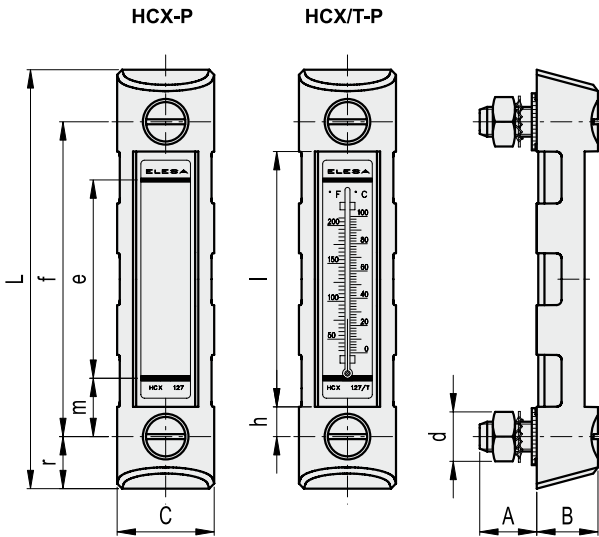
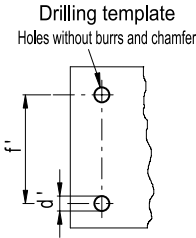
Features and performances

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal. Maximum fluid level visibility even from side positions. Level visibility and temperature reading magnified by lens effect. All shocks are absorbed by the frame that transmits them directly onto the wall of the reservoir, since the indicator is suspended between the rubber packing rings. The frame is equipped with a wide front opening and three slots on each side that, combined with the indicator made entirely of transparent material, guarantee maximum fluid level visibility even from side positions.

Technical data

During breaking strength tests performed in ELESA laboratories, the indicator with the frame withstood violent shocks up to 35 J. In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up to 18 bar. If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Conversion Table	
1 mm = 0.039 inch	
f	
mm	inch
127	5.00



metric units

Elesa Standards		Main dimensions											Mounting holes		C #	ΔΔ
Code	Description	f	d	A	B	C	L	e	h	l	m	r	d'-0.2	f±0.2	[Nm]	g
11371	HCX.127-P-M12	127	M12	23	25	39	169	80	12	103	23	21	12.5	127	12	279
11376	HCX.127/T-P-M12	127	M12	23	25	39	169	80	12	103	23	21	12.5	127	12	281

Maximum tightening torque.

Column level indicators stainless steel assembly screws



• Material

Transparent polyamide based (PA-T) technopolymer. High resistance to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters.

Avoid contact with alcohol or detergents containing alcohol.

• Screws, nuts and washers

AISI 303 stainless steel screws, AISI 304 stainless steel nuts and washers.

• Packing rings

FKM type VITON® O-Ring.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN) in the needed positions.

• Standard executions

- **HCX-SST**: without thermometer.
- **HCX/T-SST**: with incorporated thermometer.

• Assembly

- By means of the supplied set screws and nuts.
- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

UV resistant transparent technopolymer indicators.

Features and performances

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions.

Level visibility and temperature reading magnified by lens effect.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCX.76-SST 18 bar
- HCX.127-SST 18 bar
- HCX.254-SST 12 bar

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Other standard executions

- HCX-AR (see page 86) for use with fluids containing alcohol.
- HCX-BW-SST (see page 87) for use with hot water.

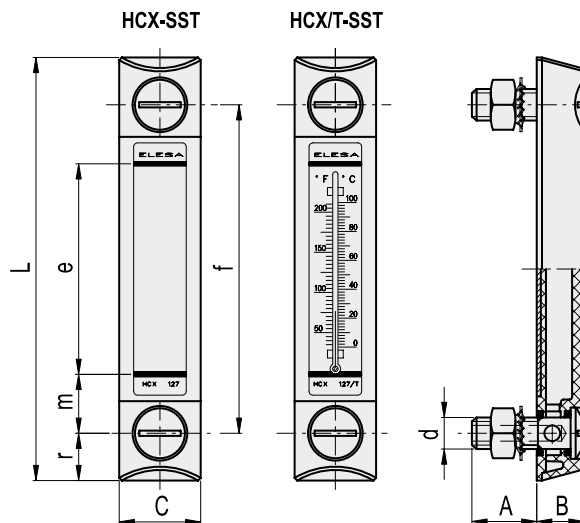
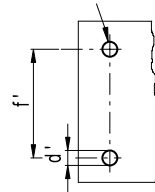
* Registered trademark by DuPont Dow Elastomer.



Conversion Table
1 mm = 0.039 inch

mm	inch
76	2.99
127	5.00
254	10.00

Drilling template
Holes without burrs and chamfer



Elesa Standards		Main dimensions										Mounting holes		Thermometer scale		C #	ΔΔ
Code	Description	f	d	A	B	C	L	e	m	r		d'-0.2	f±0.2	°C	°F	[Nm]	g
11343	HCX.76-SST-M10	76	M10	22	16	27	107	40	18	15.5		10.5	76	-	-	12	87
11348	HCX.76/T-SST-M10	76	M10	22	16	27	107	40	18	15.5		10.5	76	20+100	68+210	12	87
11353	HCX.127-SST-M12	127	M12	23	18	31	161	80	23	17		12.5	127	-	-	12	138
11358	HCX.127/T-SST-M12	127	M12	23	18	31	161	80	23	17		12.5	127	0+100	32+210	12	138
11363	HCX.254-SST-M12	254	M12	21	18	35	291	203	26	18.5		12.5	254	-	-	10	185
11368	HCX.254/T-SST-M12	254	M12	21	18	35	291	203	26	18.5		12.5	254	0+100	32+210	10	185

Maximum tightening torque.

Column level indicators technopolymer assembly screws



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.

• Screws

Glass-fibre reinforced SUPER-polyamide based (PA) technopolymer.

• Nuts and washers

AISI 304 stainless steel.

• Packing rings

NBR synthetic rubber (on request FKM) O-Ring.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN), in the needed positions.

• Standard executions

- HCX-VT: without thermometer.

- HCX/T-VT: with incorporated thermometer.

• Assembly

- By means of the supplied set screws and nuts.

- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

- By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

UV resistant transparent technopolymer indicators.

Features and performances

Thanks to the SUPER-technopolymer screws, HCX/VT column level indicator can be used in corrosion resistance applications where stainless steel is not necessary.

The special slotted head of the SUPER-technopolymer screws is especially designed to reach an optimum tightening of the packing rings by applying an adequate tightening torque (ELESA patent) thus avoiding unnecessary stress to the screws.

Maximum fluid level visibility even from side positions.

Visibility and temperature reading magnified by lens effect.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCX.127-VT 18 bar

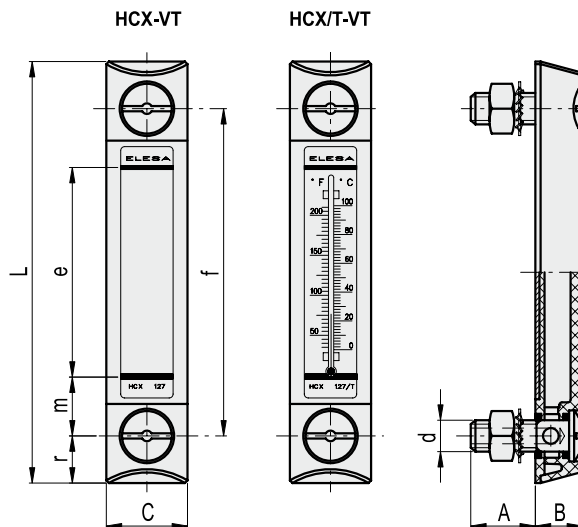
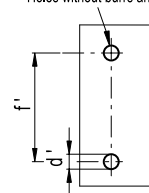
- HCH.254-VT 12 bar

Considering the SUPER-technopolymer screws, the maximum working pressure cannot be higher than 5 bar at 20°C and 2 bar at 90°C.


If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Conversion Table 1 mm = 0.039 inch	
f	
mm	inch
127	5.00
254	10.00

Drilling template
Holes without burrs and chamfer



metric units

Elesa Standards		<div>▼</div> Main dimensions										Mounting holes		Thermometer scale		C #	
Code	Description	f	d	A	B	C	L	e	m	r	d'-0.2	f±0.2	°C	°F	[Nm]	g	
111351	HCX.127-VT-M12	127	M12	23	18	31	161	80	23	17	12.5	127	-	-	6	94	
111361	HCX.127/T-VT-M12	127	M12	23	18	31	161	80	23	17	12.5	127	0+100	32+210	6	94	
111371	HCX.254-VT-M12	254	M12	21	18	35	291	203	26	18.5	12.5	254	-	-	6	141	
111381	HCX.254/T-VT-M12	254	M12	21	18	35	291	203	26	18.5	12.5	254	0+100	32+210	6	141	

Maximum tightening torque.

Column level indicators for fluids containing alcohol



• Material

Transparent polyamide based (PA-T/AR) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters, additives and detergents containing alcohol.

• Screws, nuts and washers

Zinc-plated steel.

• Packing rings

NBR synthetic rubber O-Ring.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN) in the needed positions.

• Standard executions

- HCX-AR: without thermometer.

- HCX/T-AR: with incorporated thermometer.

• Assembly

- By means of the supplied set screws and nuts.

- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

- By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

80°C.

Features and performances

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions.

Level visibility and temperature reading magnified by lens effect.

Technical data

In laboratory tests carried out with mineral oil for hydraulic systems type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCX.76-AR M10

- HCX.127-AR M12

- HCX.254-AR M12

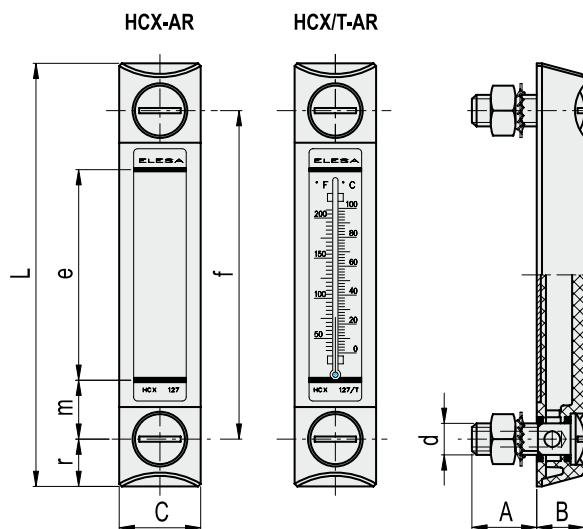
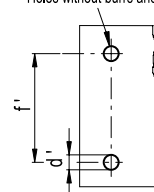
If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.



Conversion Table
1 mm = 0.039 inch

mm	inch
76	2.99
127	5.00
254	10.00

Drilling template
Holes without burrs and chamfer



metric units

Elesa Standards		Main dimensions										Mounting holes		Thermometer scale		C #	ΔΔ
Code	Description	f	d	A	B	C	L	e	m	r		d'-0.2	f±0.2	°C	°F	[Nm]	g
11342	HCX.76-AR-M10	76	M10	22	16	27	107	40	18	15.5		10.5	76	-	-	8	87
11347	HCX.76/T-AR-M10	76	M10	22	16	27	107	40	18	15.5		10.5	76	20÷100	68÷210	8	87
11352	HCX.127-AR-M12	127	M12	23	18	31	161	80	23	17		12.5	127	-	-	8	138
11357	HCX.127/T-AR-M12	127	M12	23	18	31	161	80	23	17		12.5	127	0÷100	32÷210	8	138
11362	HCX.254-AR-M12	254	M12	21	18	35	291	203	26	18.5		12.5	254	-	-	8	185
11367	HCX.254/T-AR-M12	254	M12	21	18	35	291	203	26	18.5		12.5	254	0÷100	32÷210	8	185

Column level indicators
for hot water

RoHS

PA-T

+80°
-20°

- Material**
Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.
The special technopolymer used for HCX-BW-SST column level indicator allows to use it even in circuits working with very hot water and prevents milk effect on the transparent surface.
- Screws, nuts and washers**
AISI 303 stainless steel screws, AISI 304 stainless steel nuts and washers.
- Packing rings**
FKM type VITON® O-Ring.
- Contrast screen**
White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.
It can be removed before installation to fit marks and words (for example MAX-MIN), in the needed positions.
- Assembly**
 - By means of the supplied set screws and nuts.
 - By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.
To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface Ra = 3 µm.
- Maximum continuous working temperature**
80°C with peaks of 90°C.

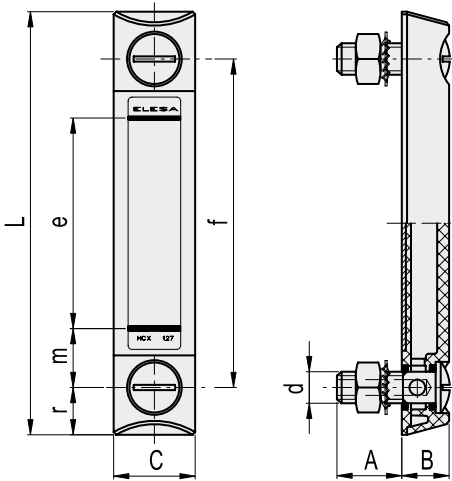
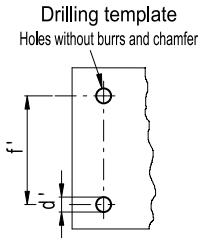
Features and performances
The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.
Maximum fluid level visibility even from side positions.
Level visibility magnified by lens effect.

Technical data
In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:
- HCX.76-BW-SST 10 bar
- HCX.127-BW-SST 10 bar
- HCX.254-BW-SST 10 bar
If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.
* Registered trademark by Dupont Dow Elastomer.

Conversion Table	
1 mm = 0.039 inch	
f	
mm	inch
76	2.99
127	5.00
254	10.00

Elesa Standards		Main dimensions									Mounting holes		C #	ΔΔ
Code	Description	f	d	A	B	C	L	e	m	r	d'-0.2	f±0.2	[Nm]	g
11345	HCX.76-BW-SST-M10	76	M10	22	16	27	107	40	18	15.5	10.5	76	8	87
11355	HCX.127-BW-SST-M12	127	M12	23	18	31	161	80	23	17	12.5	127	8	138
11365	HCX.254-BW-SST-M12	254	M12	21	18	35	291	203	26	18.5	12.5	254	8	185

Maximum tightening torque.



Column level indicator with float for indirect level reading



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha and phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.

• Screws, nuts and washers

Zinc-plated steel.

• Packing rings

NBR synthetic rubber O-Ring.

• Float

Ebonite, black colour.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures. It can be removed before installation to fit marks and words (for example MAX-MIN) in the needed positions.

• Assembly

- By means of the supplied set screws and nuts.
- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

UV resistant transparent technopolymer indicators.

Features and performances

HCX-LT column level indicator allows the fluid level reading by means of a float when, due to the particular design of the system, the fluid level cannot be seen directly from the lower part of the indicator.

The plastic foam float is moved upward by the fluid contained in the reservoir. This system allows an indirect reading of the level.

The red line on the lacquered contrast screen is visible only when the float is in its lowest position (minimum fluid level = m).

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions.

Level visibility and temperature reading magnified by lens effect.

Assembly instructions

To ensure proper assembly of the indicator, please follow these instructions:

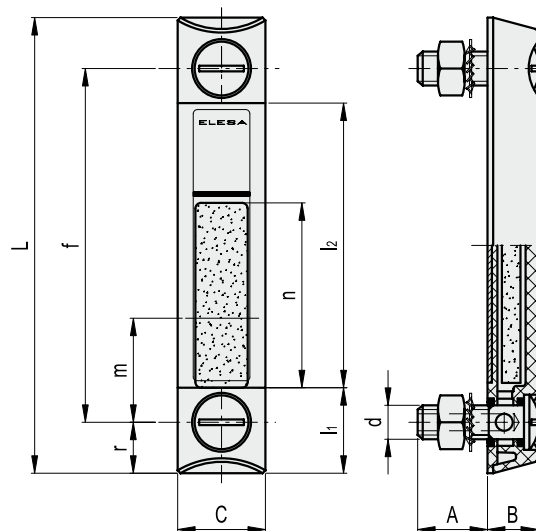
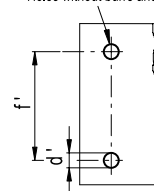
1. Set the minimum oil level of your reservoir.
2. Drill two holes on the reservoir wall. The lower hole axis should be drilled at "m" distance (see table) under the minimum oil level. "m" is the minimum oil level allowed. This is the level from which the float starts to be moved upward. The value "m" is calculated with an oil density of 875 Kg/m³ at 15°C. If the red line of the contrast screen appears, the oil level is under its minimum level allowed.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up to 12 bar. If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.




Drilling template
Holes without burrs and chamfer



metric units

Conversion Table 1 mm = 0.039 inch	
f	
mm	inch
254	10.00

Elesa Standards		<div>▼</div> Main dimensions											Mounting holes		C #	
Code	Description	f	d	A	B	C	L	l1	l2	m*	n	r	d'-0.2	f±0.2	[Nm]	g
11364	HCX.254-LT-M12	254	M12	21	18	35	291	32	225	46	140	18.5	12.5	254	6	215

* See Assembly instructions.

Maximum tightening torque.

FM Kit

Fast Mounting Kit



- **Nut**
Zinc-plated steel.
- **Packing ring**
NBR synthetic rubber.

Features

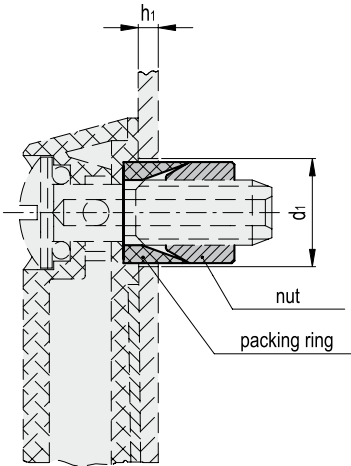
The FM kit (fast mounting kit) has been designed for mounting level indicators series HCX. from the outside when nuts cannot be fitted from the inside of the reservoir.

Assembly of the indicator with the FM Kit (fast mounting kit)

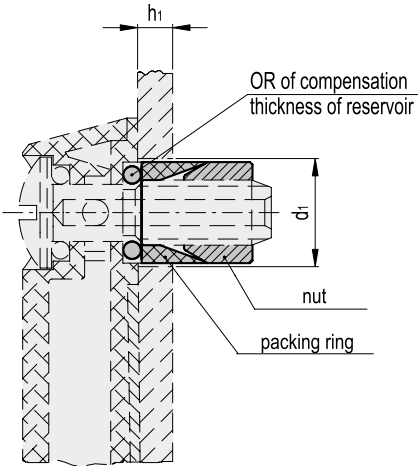
1. Arrange the holes d_1 as reported in the table and make sure that the holes in the plate do not have any burrs, especially inside the reservoir.
2. Unscrew the nuts from the HCX. indicator and take out the washers supplied with the standard execution, put the packing ring inside and screw the nuts (with or without O-Ring according to the thickness h_1).
3. Before assembly the indicator on the reservoir, slightly tighten the nut by hand against the packing ring. We advise you, then, to deform slightly the threaded end of the screw in order to prevent the nut from falling into the reservoir while disassembling the indicator.
4. To disassemble the indicator from the reservoir, just rotate the screw $3/4$ of a turn keeping the plastic part of the indicator under tension (pulling).



$1.5 < h_1 < 4.7$
(assembly without O-ring)



$4.7 < h_1 < 6.3$
(assembly with O-ring)



metric units

Elesa Standards		$d_1 \pm 0.1$	Without O-Ring		With O-Ring		Maximum tightening torque
Code	Description		h_1 min	h_1 max	h_1 min	h_1 max	[Nm]
31801	FM-HCX.76-M10-KIT	16	1.5	4.7	4.7	6.3	7
31811	FM-HCX.127-254-M12-KIT	17.5	1.5	4.7	4.7	6.3	7

Column level indicators with or without transparent protection (Elesa patent)

PA

PC

RoHS

+100°
-30°

• Assembly ends

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour.

• Support

Aluminium in natural colour.

• Column level window

Polycarbonate transparent tube.

Maximum fluid level visibility even from side positions.

• Screws, nuts and washers

Zinc-plated steel.

• Packing rings

NBR rubber O-Ring.

• Graduated contrast screen

Self-adhesive plastic material, resistant to oils, greases.

Fitted to the aluminium support.

• Standard executions

- **HCK**: with transparent front protection (against accidental shocks), in polycarbonate (PC), extractable for cleaning operations.

- **HCK-NP**: without transparent front protection.

• Maximum continuous working temperature

100°C (with oil).

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the values of pressure resistance were very high.

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESa Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Special executions on request

- Column level window in transparent methylmethacrylate (PMMA) for max 70°C use.
- AISI 303 stainless steel screws with hexagon socket.
- Polyamide based technopolymer float (from HCK.127) red colour.
- Expanded NBR float (from HCK.176) black colour with AISI 316 stainless steel spiral for special executions, viscous liquids, high temperatures.
- Column level window with visibility (l2) superior to 452 mm and holes centre distance for fixing up to 1.500 mm.
- Electric sensor bracket pre-set at the following temperatures: 50°C, 60°C, 70°C, 80°C.
- Packing rings in special material depending on the customer's needs.
- Built-in thermometer with red indication line.
- External scale thermometer (Fig. 1) with internal probe for fluid temperature.
- Electric level sensor (Fig.2, from HCK.254) which can be fitted along the axis of the indicator according to the actual needs. With right (DX) or left (SX) connectors, normally closed (NC), normally open (NO).
- Special screw with nickel-plated brass tap (Fig. 3) to be fitted to the lower assembly end for any maintenance operation requiring the indicator exclusion.

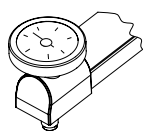


Fig.1

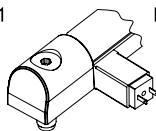


Fig.2

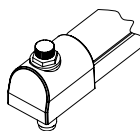
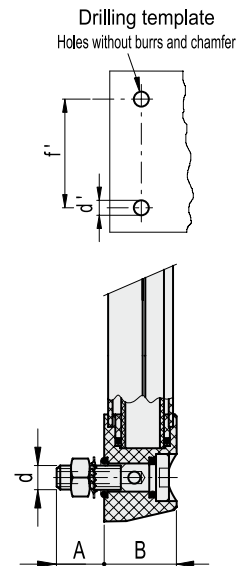
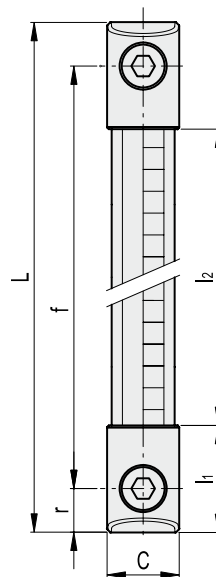
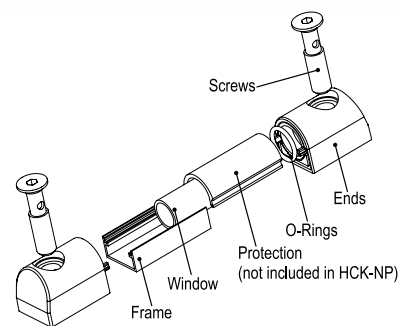


Fig.3



Conversion Table 1 mm = 0.039 inch	
f	
mm	inch
76	2.99
127	5.00
176	6.93
254	10.00
381	15.00
508	20.00



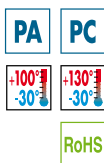
HCK

HCK-NP

metric units

Elesa Standards				Main dimensions									Mounting holes		C #	ΔΔ
Code	Description	Code	Description	f	d	A	B	C	L	l1	l2	r	d'-0.2	f±0.2	[Nm]	g
111001	HCK.76-M10	111001-NP	HCK.76-M10-NP	76	M10	20	33	33	113	35.5	42	18.5	10.5	76 ±0.2	12	183
111011	HCK.127-M12	111011-NP	HCK.127-M12-NP	127	M12	20	33	33	164	46.5	71	18.5	12.5	127±0.5	12	220
111021	HCK.176-M12	111021-NP	HCK.176-M12-NP	176	M12	20	33	33	213	46.5	120	18.5	12.5	176±0.5	12	250
111031	HCK.254-M12	111031-NP	HCK.254-M12-NP	254	M12	20	33	33	291	46.5	198	18.5	12.5	254±0.5	12	298
111041	HCK.381-M12	111041-NP	HCK.381-M12-NP	381	M12	20	33	33	418	46.5	325	18.5	12.5	381±0.5	12	377
111051	HCK.508-M12	111051-NP	HCK.508-M12-NP	508	M12	20	33	33	545	46.5	452	18.5	12.5	508±0.5	12	455

Column level indicators for glycol-based solutions with transparent protection (Elesa patent)



• Assembly ends

Glass-fibre reinforced polyamide based (PA) technopolymer, black colour.

• Support

Aluminium in natural colour.

• Column level window

Transparent tube in Pyrex glass, also suitable for use with glycol-based solutions.

Maximum fluid level visibility even from side positions.

• Transparent front protection (against accidental shocks)

Polycarbonate (PC), extractable for cleaning operations.

• Screws, nuts and washers

- **HCK-GL:** zinc-plated steel screws with hexagon socket, nuts and washers.

- **HCK-GL-SST:** AISI 303 stainless steel screws with hexagon socket, AISI 304 stainless steel nuts and washers.

• Packing rings

- **HCK-GL:** NBR rubber O-Ring.

- **HCK-GL-SST:** FKM type VITON® synthetic rubber O-Ring.

• Graduated contrast screen

Self-adhesive plastic material, resistant to oils, greases.

Fitted to the aluminium support.

• Maximum continuous working temperature

- **HCK-GL:** 100°C (with oil, water, glycol-based solutions).

- **HCK-GL-SST:** 130°C (with oil, water, glycol-based solutions). In laboratory tests these indicators showed an excellent resistance to temperatures up to 150/160°C for many hours with pressures of 5/6 bar.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) water or water/glycol-based solutions (50%), at 23°C for a relatively limited time, the values of pressure resistance were very high even higher than 30 bar.

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Special executions on request

- Polyamide based technopolymer float (from HCK.127) red colour.

- Expanded NBR float (from HCK.176) black colour with AISI 316 stainless steel spiral for special executions, viscous liquids, high temperatures.

- Column level window with visibility (l2) superior to 452 mm and holes centre distance (f) for fixing up to 1.500 mm.

- Electric sensor bracket pre-set at the following temperatures: 50°C, 60°C, 70°C, 80°C.

- Packing rings in special material depending on the customer's needs.

- Built-in thermometer with red indication line.

- External scale thermometer (Fig. 1) with internal probe for fluid temperature.

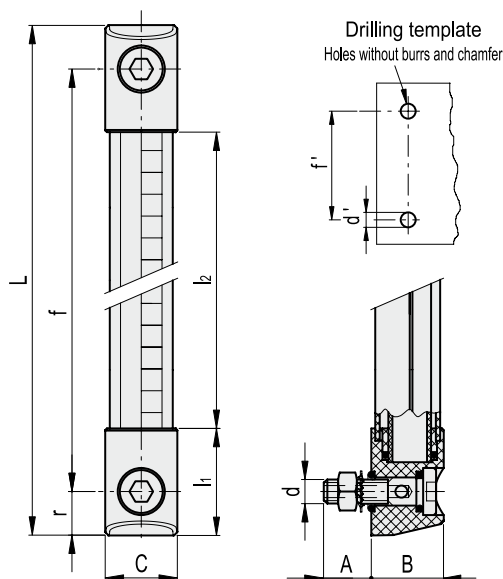
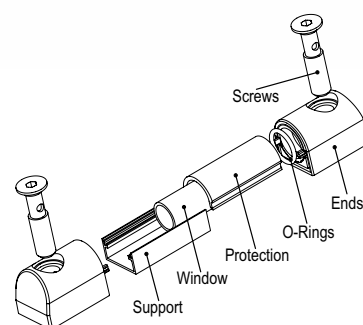
- Electric level sensor (Fig.2, from HCK.254) which can be fitted along the axis of the indicator according to the actual needs. With right (DX) or left (SX) connectors, normally closed (NC), normally open (NO).

- Special screw with nickel-plated brass tap (Fig. 3) to be fitted to the lower assembly end for any maintenance operation requiring the indicator exclusion.

* Registered trademark by DuPont Dow Elastomers.



Conversion Table 1 mm = 0.039 inch	
f	
mm	inch
76	2.99
127	5.00
176	6.93
254	10.00
381	15.00
508	20.00

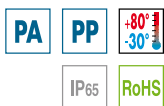


HCK-GL

Elesa Standards		Main dimensions										Mounting holes		C #	Δ	Elesa Standards	
Code	Description	f	d	A	B	C	L	l1	l2	r	d'-0.2	f'±0.2	[Nm]	g		Code	Description
111004	HCK.76-GL-M10	76	M10	20	33	33	113	35.5	42	18.5	10.5	76	12	183		111005	HCK.76-GL-SST-M10
111014	HCK.127-GL-M12	127	M12	20	33	33	164	46.5	71	18.5	12.5	127	12	220		111015	HCK.127-GL-SST-M12
111024	HCK.176-GL-M12	176	M12	20	33	33	213	46.5	120	18.5	12.5	176	12	250		111025	HCK.176-GL-SST-M12
111034	HCK.254-GL-M12	254	M12	20	33	33	291	46.5	198	18.5	12.5	254	12	298		111035	HCK.254-GL-SST-M12
111044	HCK.381-GL-M12	381	M12	20	33	33	418	46.5	325	18.5	12.5	381	12	377		111045	HCK.381-GL-SST-M12
111054	HCK.508-GL-M12	508	M12	20	33	33	545	46.5	452	18.5	12.5	508	12	455		111055	HCK.508-GL-SST-M12

Maximum tightening torque.

Kit for the electric control of a fluid level on HCK. and HCK-GL column level indicators



• Sensor holder bracket

In polyamide based (PA) technopolymer, black colour, watertight, with a built-in relay (reed) with two conductors wired to the two-pin connector. It can be moved along the axis of the indicator and secured in the preferred position with the appropriate screw (set screw) in technopolymer.

• Electric sensor

- **NO**: the electric circuit closes on reaching the preset level.
- **NC**: the electric circuit opens on reaching the preset level.

• Connector

With built-in cable gland and contact holders. Properly set, it offers an effective product protection against water sprays (IP 65 protection class according to IEC 529 table, see Catalogue 062 Technical data page A25) that can be increased during installation with the necessary adjustments. NBR synthetic rubber packing rings.

• Float

Polypropylene based (PP) technopolymer, black colour, with a built-in magnetic element to activate the electric contact when the float reaches the trigger threshold.

The trigger threshold is determined by the user, by positioning the sensor holder along the axis of the indicator.

• Spacers

In polyamide based (PA) technopolymer. Essential in cases where the reservoir is made out of ferromagnetic material in order to prevent the interaction between the magnet and the metal mass of the reservoir.

• Kit

The kit includes one or two sensor holder brackets, a float, 4 O-rings (2 FKM for HCK-GL and 2 NBR for HCK) and two spacers.

It is possible to apply more than one kit to get the electric control of different levels, consistently with the height of the transparent column.

• Standard executions

- **SLCK-NO**: with electric contact normally open.
- **SLCK-NC**: with electric contact normally closed.
- **SLCK-NO-NC**: with one electric contact normally open and one electric contact normally closed.
- **SLCK-NC-NC**: with two electric contacts normally closed.
- **SLCK-NO-NO**: with two electric contacts normally open.

• Maximum working temperature

80°C (with oil).

Features and performances

With the application of the SLCK kit, HCK. and HCK-GL column level indicators provide an electric signal when the fluid level reaches the level of preset intervention, besides the visual control of the level. The electric control of the level can be applied on all versions of HCK. from the version with 127 mm hole centre distance while always maintaining the visibility of fluid level even from side positions.

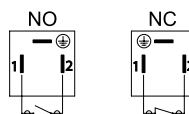
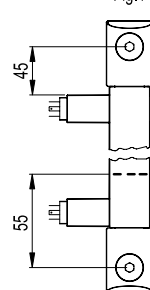
In the highest position, the sensor holder must be positioned at least 45 mm below the axis of the high screw (Fig.1), so that the switching takes place correctly.

In the lowest position, the fluid level which determines the switching of the electric circuit is of about 55 mm above the axis of the low screw of fluid supply (data referring to mineral oil type CB68, according to ISO 3498, temperature 23°C) (Fig. 1).

The sensor holder is arranged to be installed to the left with respect to the axis of the indicator. However, if required it can also be mounted on the right. The connector can be rotated by 90° in four positions when wiring. For a correct assembly see Warnings.



Fig.1



Level sensor electric characteristics

Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage	230 VDC / VAC
Max. opening capacity (CC CA)	2 A
Max. commutable power	40W / VA
Cable gland	Pg 7 (for cables in sheath with Ø6 or 7 mm)
Conductors max. cross-section	1.5 mm ²

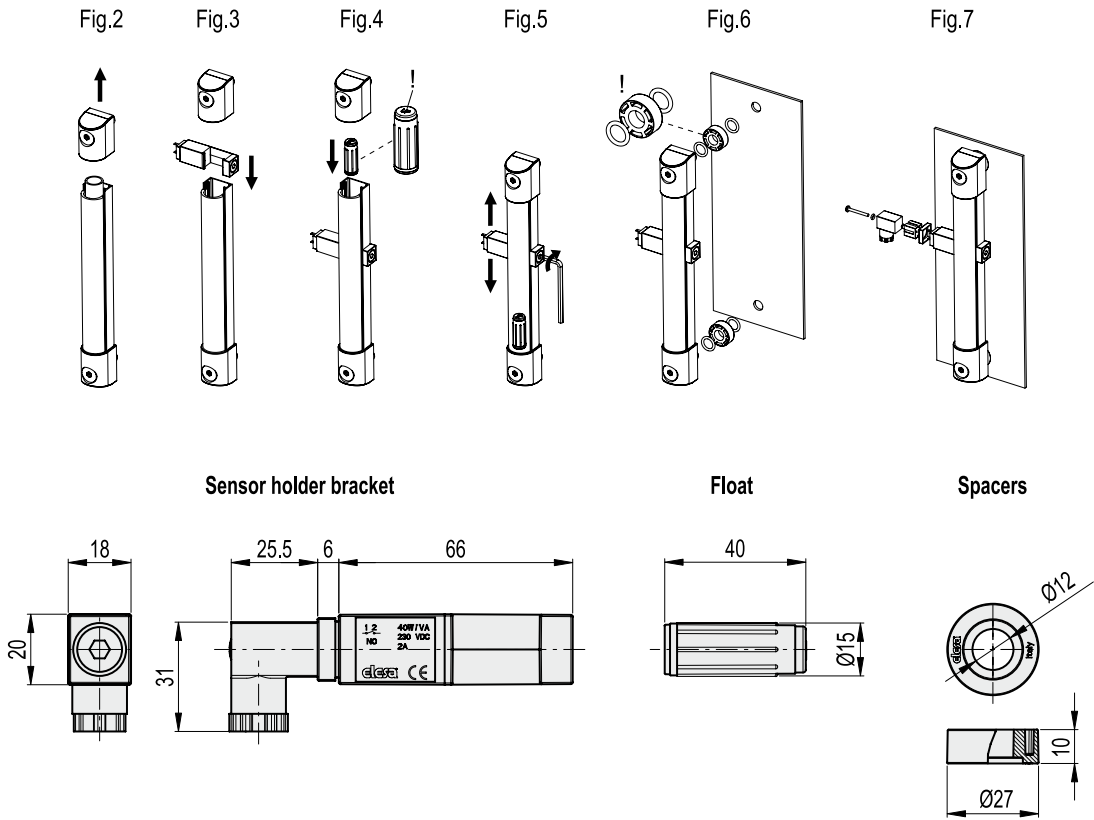
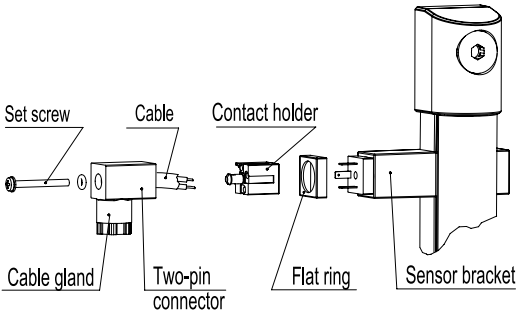
Do not mount this indicator in proximity to magnetic fields

Kit assembly instructions

- Remove the assembly end of the indicator (Fig. 2).
- Insert the sensor holder bracket (Fig. 3).
- Insert the float with the word "up" to the top and relocate the assembly end in place (Fig. 4).
- Clamp the bracket with the set screw to the desired position (Fig. 5).
- Install the indicator on the reservoir using the spacers included in the supply (necessary in case of reservoir made out of ferromagnetic material in order to avoid interaction between the magnet and the metal mass (Fig.6).
- Assemble the two-pin connector (Fig. 7).

Two-pin connectors assembly instructions

1. Remove the connector from the sensor holder bracket by unscrewing the axial set screw, take off the contact holder and unscrew the cable gland as required.
2. Slip on the cable into the connector and connect the wires to the terminals of the contact holder.
3. Assemble by pressing the contact holder into the connector (the contact holder can be rotated by 90° in four positions to have a different orientation of the connector).
4. Screw again the connector to the sensor holder by means of the axial set screw and then tighten the cable gland.



metric units

Elesa Standards		ΔΔ
Code	Description	g
110081	SLCK-NO	235
110083	SLCK-NC	235
110085	SLCK-NO-NC	235
110087	SLCK-NC-NC	235
110089	SLCK-NO-NO	235

Column level indicators
with U shaped protections



- **Assembly ends**
Glass-fibre reinforced polyamide based (PA) technopolymer, black colour.
- **Support**
Aluminium in natural colour. It can be turned by 90°C where necessary.
- **Level column window**
Polymethylmetacrylate transparent tube.
- **Screws**
Zinc-plated steel with hexagon socket.
- **Packing rings**
NBR synthetic rubber O-Ring.
- **Graduated contrast screen**
Plastic material, resistant to oils and greases. Fitted to the aluminium protection by means of an adhesive tape.
- **Maximum continuous working temperature**
70°C (with oil or water).

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

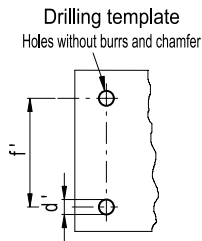
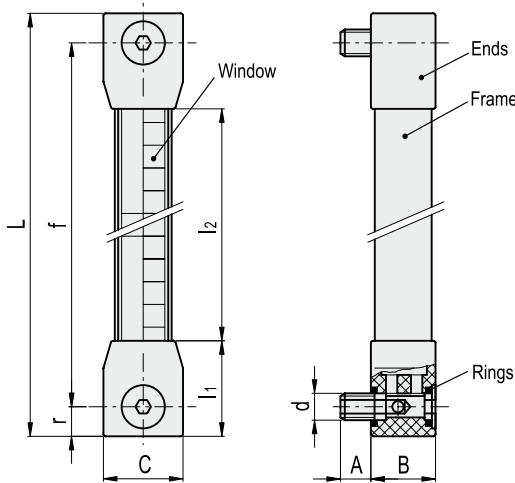
- HCL.300 30 bar
- HCL.400 25 bar
- HCL.500 20 bar

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESa Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Special executions on request

- Column level indicators with tubes and assembly ends in different materials for the use with special fluids and/or at high temperatures.
- AISI 316 stainless steel or nickel-plated brass screws.
- Polyamide based (PA) technopolymer float, red colour to highlight the level also from a long distance.
- Column level indicators with fitting centre-holes up to 2000 mm.
- HCL-E column oil level indicators including float, minimum level signal, normally closed contacts (NC), normally open (NO) or CHANGE OVER.
- Adjustable level sensors which can be placed along the axis of the indicator, with right (DX) or left (SX) connectors, normally closed (NC), normally open (NO) or CHANGE OVER contacts.
- EPDM or FKM type* VITON®* packing rings.

* Registered trademark by DuPont Dow Elastomers.



Conversion Table	
1 mm = 0.039 inch	
f	
mm	inch
300	11.81
400	15.75
500	19.69

metric units

Elesa Standards		Main dimensions										Mounting holes		C #	ΔΔ
Code	Description	f	d	A	B	C	L	l1	l2	r		d'-0.2	f'±0.2	[Nm]	g
111211	HCL-300-M12	300	M12	13.5	28.5	35	326	42	242	13		12.5	300	15	227
111221	HCL-400-M12	400	M12	13.5	28.5	35	426	42	342	13		12.5	400	15	268
111231	HCL-500-M12	500	M12	13.5	28.5	35	526	42	442	13		12.5	500	15	306

Maximum tightening torque.

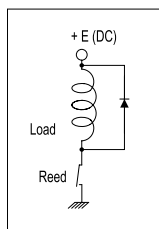
Warnings for an effective protection of the Reed switches

The electric features of the Reed switches, shown in the descriptive tables, are supplied by the manufacturers. For a Reed switch connection, it is recommended to pay a special attention to the type of load to which the switch is going to be connected. For their nature inductive, capacitive or lamp loads, may produce surges during operation. These surges may damage the Reed switch or drastically reduce its operating life.

Inductive load

When a Reed switch is used to guide an inductive load such as engines and solenoid valves, the energy stored in the load may cause an inverse voltage when the Reed contact breaks. The voltage depends on the inductance value. The following circuits provide a protection in the cases hereunder mentioned.

In case of continuous voltage, it is enough to introduce a diode in parallel to the load respecting the polarity, to avoid any damage to the Reed switch.

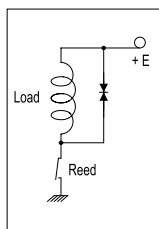


In case of alternating voltage, it is possible to use a resistance and a capacitance in parallel to the Reed switch. The values capacitance and resistance come out from the following formula.

$$C [\mu F] = \frac{I^2}{10}$$

$$R [\Omega] = \frac{E}{10 \cdot I \left(1 + \frac{E}{50}\right)}$$

An alternative solution may be to use a varistor in parallel to the load.

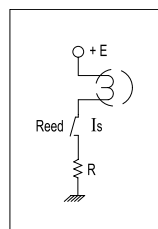


Lamp load

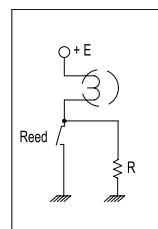
In case of a tungsten filament lamp, the filament resistance when the lamp is switched off (cold filament) is 10 times smaller than in case of the lamp switched on (hot filament).

After the Reed contact commutation, at after the lamp turning on, for a short time the in-rush current is 10 times higher than the one circulating in steady state. This flow may damage the Reed contact or jeopardize its duration.

In this case, the solution is to introduce a resistance in series to the Reed switch, this cutting the maximum value of the current, or a resistance in parallel to the Reed switch, to keep the filament hot (by increasing the resistance) without causing the lamp turning on.



R = Protection resistance
It must be properly chosen so that
 $I_s < 0.5 A$



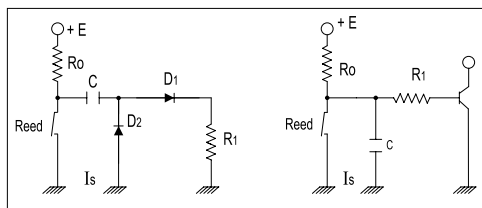
$R < \frac{\text{Filament resistance}}{3}$

Capacitive load

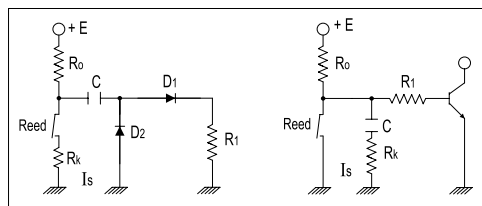
In case a capacitor is connected in series or in parallel with a Reed switch in a closed circuit, the in-rush current, which flows during charge and discharge of the capacitor, will cause deterioration of the Reed contacts. In this situation, the easiest and more effective solution is to position a resistance in series to the Reed switch or, in general, a resistance properly set in order to cut the maximum value of the currents of charge and discharge.

Here are two examples of circuit, in which the energy, stored in the capacitive load "C", generates rush currents discharging through the Reed contact. The use of a properly calibrated resistance reduces the value of these currents and protects the operating life of the Reed contact.

Circuit without protection



Circuit with protection



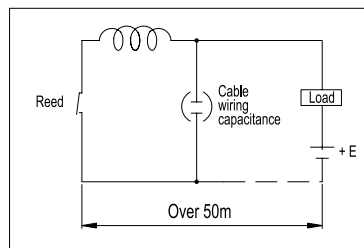
R_k is the resistance that limits the surges.
The value of R_k resistance depends on the circuit electric configuration.
As a general rule:

$$I_s = \frac{V_{\text{stored in the load}}}{R_k [K\Omega]} < 0,1 A$$

Wiring capacitance

In case a Reed switch is connected to a load by a cable, over a long distance, the static capacitance caused by the cable will affect the Reed switch.

Although it depends on the type of cable used, it is recommended that, in case the cable length exceeds 50 meters, protection is required for assuring a longer operating life of the Reed switch. In this situation an inductance in series to the Reed switch or a small resistance (current-limiting resistor of 10 to 500 ohms) can be inserted.



Column level indicators with MAX temperature electrical sensor

PA-T

+90°
-30°

IP65

RoHS

• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.

• Screw, nuts and washers

Zinc-plated steel.

• Packing rings

NBR synthetic rubber O-Ring.

• MAX temperature electrical sensor (80°C)

Zinc-plated screw with built-in sensor.

Temperature of intervention is 80°C.

For a correct assembly see Warnings.

• Swivelling two-pin connector

With built-in cable gland and contact holder. Front or side output (right or left) including protection against water sprays (protection class IP 65 according to IEC 529 table, see Catalogue 062 Technical data page A25) that can be increased during installation with the necessary adjustments. Flat NBR synthetic rubber packing rings.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN), in the needed positions.

• Standard executions

- HCX-ST-NO: with electrical contact normally open.

- HCX-ST-NC: with electrical contact normally closed.

• Assembly

- By means of the supplied set screws and nuts.

- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

- By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

- Level indicators for use with fluids containing alcohol or with hot water.

- UV resistant transparent technopolymer indicators.

- Temperature electrical sensor with pre-set temperatures different from 80°C.

Features and performances

This column level indicator generates an electric signal when the temperature reaches the pre-set degrees (80°C).

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions.

Level visibility magnified by lens effect.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCX.127-ST 18 bar

- HCX.254-ST 12 bar

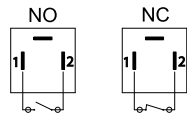
If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.



Functioning

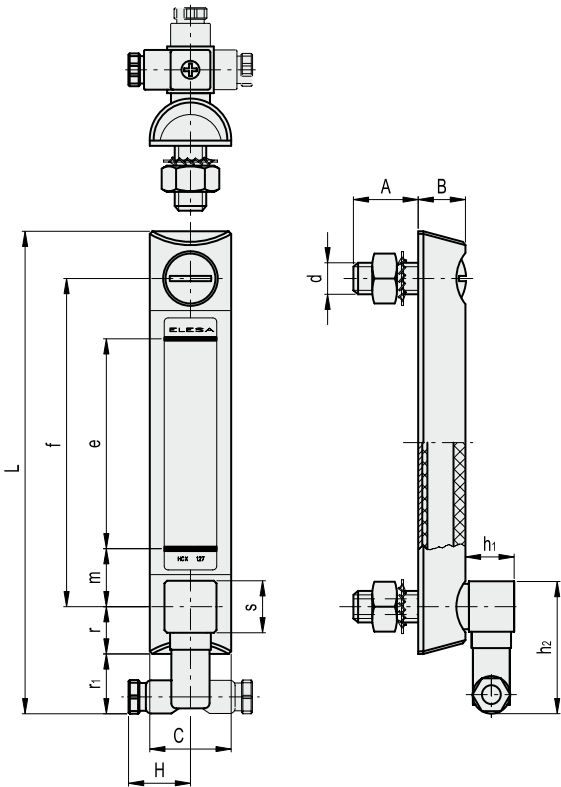
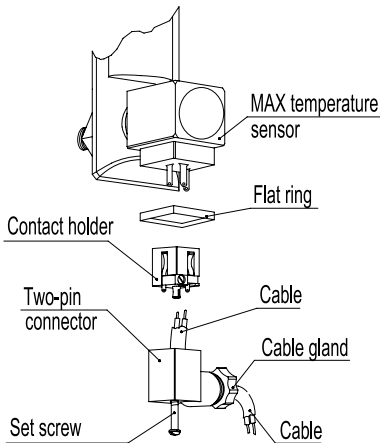
- HCX-ST-NO with electrical contacts normally open. Electrical temperature sensor: the electrical circuit is closed when the pre-set temperature at 80°C is reached.
- HCX-ST-NC with electrical contacts normally closed. Electrical temperature sensor: the electrical circuit is open when the pre-set temperature at 80°C is reached.

Electric characteristics	MAX temperature sensor
Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage/ opening capacity	250 Vac - 10 A 48 Vdc - 5 A (resistive loads)
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

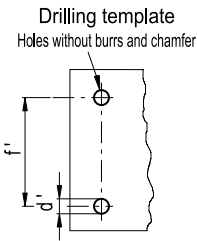


Two-pin connector assembly instructions



1. Remove the connector from the indicator by unscrewing the set screw placed in the bottom, take the contact holder out and loosen the cable gland.
2. Slip on the two-pole cable into the connector (standard connector) and connect the wires to the terminals nr. 1 and nr. 2 of the contact holder.
3. Assembly by pressing the contact holder into the connector in the required position.
4. Screw the connector to the indicator and then tighten the cable gland.



Conversion Table 1 mm = 0.039 inch	
f	
mm	inch
127	5.00
254	10.00

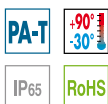


metric units

Elesa Standards		 Main dimensions														Mounting holes		C #	
Code	Description	f	d	A	B	C	H	L	e	m	r	r1	h1	h2	s	d'-0.2	f±0.2	[Nm]	g
11161	HCX.127-ST-NO-M12	127	M12	23	18	31	27	187	80	23	17	26	21	54	22x22	12.5	127	12	220
11162	HCX.127-ST-NC-M12	127	M12	23	18	31	27	187	80	23	17	26	21	54	22x22	12.5	127	12	220
11171	HCX.254-ST-NO-M12	254	M12	21	18	35	27	315	203	26	18.5	24	21	54	22x22	12.5	254	10	265
11172	HCX.254-ST-NC-M12	254	M12	21	18	35	27	315	203	26	18.5	24	21	54	22x22	12.5	254	10	265

Maximum tightening torque.

Column level indicators with temperature electrical probe



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.

• Screw, nuts and washers

Zinc-plated steel.

• Packing rings

NBR synthetic rubber O-Ring.

• Temperature electrical probe

Zinc-plated steel screw with built-in probe. The probe is made out of a platinum resistor whose ohmic resistance changes according to the temperature.

For a correct assembly see Warnings.

• Swivelling two-pin connector

With built-in cable gland and contact holder. Front or side output (right or left) including protection against water sprays (protection class IP 65 according to IEC 529 table, see Catalogue 062 Technical data page A25) that can be increased during installation with the necessary adjustments. Flat NBR synthetic rubber packing rings.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN), in the needed positions.

• Assembly

- By means of the supplied set screws and nuts.
- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.
- By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

- Level indicators for use with fluids containing alcohol or with hot water.
- UV resistant transparent technopolymer indicators.

Features and performances

This column level indicator generates an analogic electric signal of the oil temperature.

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions.

Level visibility magnified by lens effect.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCX.127-STL 18 bar
- HCX.254-STL 12 bar

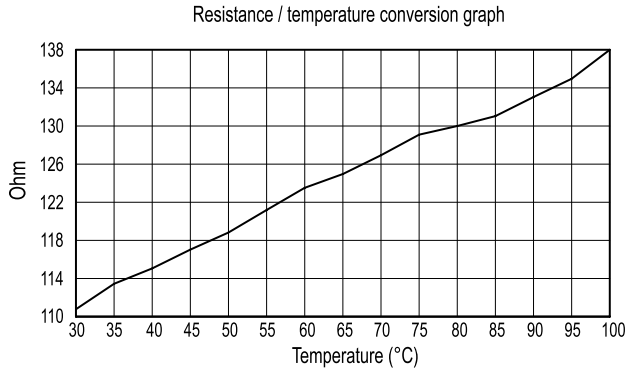
If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Functioning of the temperature electrical probe

The working principle of the temperature probe is to measure the variation of resistance of a platinum element: $100 \text{ ohm} = 0^\circ\text{C}$, $138.4 \text{ ohm} = 100^\circ\text{C}$. The function between temperature (T) and resistance (R) is approximately linear over a small temperature range: for example, if you assume that it is linear over the 0° to 100°C range, the error at 50°C is 0.4°C . For precision measurement, it is necessary to linearise the resistance to give an accurate temperature.



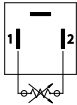
The most recent definition of the function between resistance and temperature is International Temperature Standard 90 (ITS-90). The function between resistance and temperature, obtained in laboratory tests, measuring directly the resistance value on the contacts is shown in the graph.



We suggest, anyway, to set the system in order to compensate both heat dissipation and cable resistance. A 1°C temperature change will cause a 0.384 ohm change in resistance, so even a small error in measurement of the resistance (for example, the resistance of the wires leading to the sensor) can cause a large error in the measurement of the temperature.

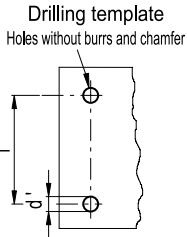
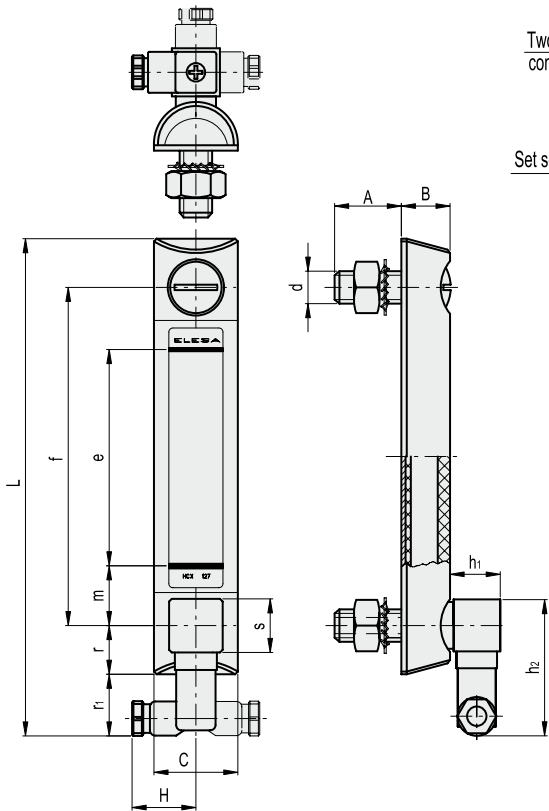
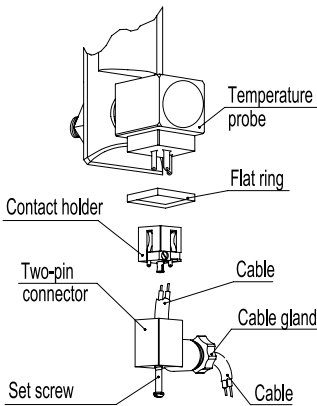
Because of the low signal levels, it is important to keep any cables away from electric cables, motors, switchgear and other devices that may emit magnetic or electrical noise. Using screened cable, with the screen grounded at one end, may help to reduce interference. When using long cables, it is necessary to check that the measuring equipment is able to handle the cable resistance.

Electric characteristics	Temperature probe
Power supply	DC
Maximum applicable voltage	2 mA
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²




Two-pin connector assembly instructions

1. Remove the connector from the indicator by unscrewing the set screw placed in the bottom, take the contact holder out and loosen the cable gland.
2. Slip on the two-pole cable into the connector (standard connector) and connect the wires to the terminals nr. 1 and nr. 2 of the contact holder.
3. Assemble by pressing the contact holder into the connector in the required position.
4. Screw the connector to the indicator and then tighten the cable gland.



Conversion Table	
1 mm = 0.039 inch	
f	
mm	inch
127	5.00
254	10.00

Elesa Standards		Main dimensions														Mounting holes		C #	
Code	Description	f	d	A	B	C	H	L	e	m	r	r1	h1	h2	s	d'-0.2	f±0.2	[Nm]	g
11166	H CX.127-STL-M12	127	M12	23	18	31	27	187	80	23	17	26	21	54	22x22	12.5	127	12	220
11176	H CX.254-STL-M12	254	M12	21	18	35	27	315	203	26	18.5	24	21	54	22x22	12.5	254	10	265

Maximum tightening torque.

Column level indicators with MIN level electrical sensor



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.

• Screws, nuts and washers

Zinc-plated steel.

• Packing rings

NBR synthetic rubber O-Ring.

• Float

Polyamide based (PA) expanded technopolymer, black colour, with a built-in magnetic element to activate the electric contact when the oil level drops to a minimum; alarm threshold located at about 50 mm from the centre of the lower nut (in presence of mineral oil type CB68, according to ISO 3498, at 23°C).

• Sensor bracket

Watertight in polypropylene based (PP) technopolymer, black colour, with a built-in relay (reed) with two conductors wired to the two-pin connector.

For a correct assembly see Warnings.

• Swivelling two-pin connector

With built-in cable gland and contact holder. Front or side output (right or left) including protection against water sprays (protection class IP 65 according to IEC 529 table, see Catalogue 062 Technical data page A25) that can be increased during installation with the necessary adjustments. Flat NBR synthetic rubber packing rings.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN), in the needed positions.

• Standard executions

- HCX-E-NO: with electrical contact normally open.
- HCX-E-NC: with electrical contact normally closed.

• Assembly

- By means of the supplied set screws and nuts.
- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.
- By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

- Level indicators for use with fluids containing alcohol.
- UV resistant transparent technopolymer indicators.

Features and performances

The column level indicator HCX-E, in addition to the visual control, generates an electric signal when the oil level drops to a minimum.

The body of the indicator, entirely in transparent material, is assembled using ultrasound welding to guarantee a perfect seal.

Maximum fluid level visibility even from side positions.

Level visibility magnified by lens effect.

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up to 13 bar. If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

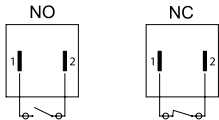


Functioning of the MIN level electrical sensor

- HCX-E-NO: the electrical circuit is closed when the minimum level is reached.
- HCX-E-NC: the electrical circuit is open when the minimum level is reached.

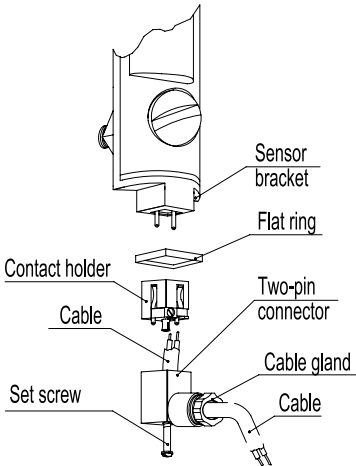
Electric characteristics	MIN level sensor
Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage	NO: 150 Vac, 100 Vdc NC: 150 Vac, 150 Vdc
Maximum commutable opening capacity	1 A
Maximum bearable opening capacity	NO: 1A NC: 2A
Maximum commutable power	NO: 10 Va NC: 20 Va
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

Do not mount this indicator in proximity to magnetic fields.

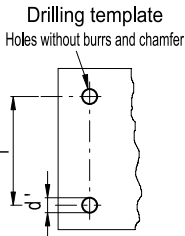
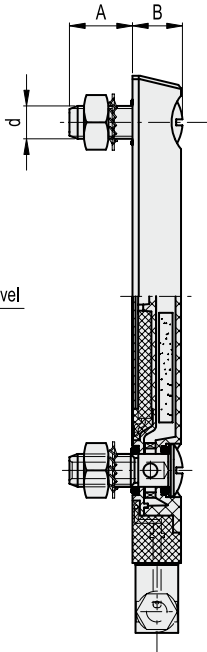
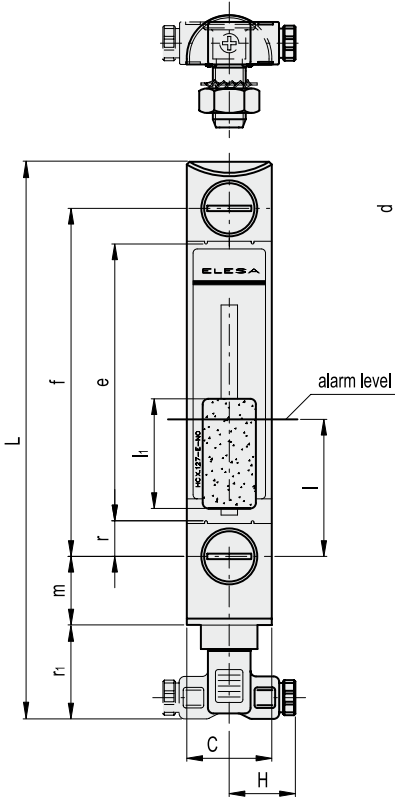



Two-pin connector assembly instructions

1. Remove the connector from the indicator by unscrewing the set screw placed in the bottom, take the contact holder out and loosen the cable gland.
2. Slip on the two-pole cable into the connector (standard connector) and connect the wires to the terminals nr. 1 and nr. 2 of the contact holder.
3. Assemble by pressing the contact holder into the connector in the required position.
4. Screw the connector to the indicator and then tighten the cable gland.



Conversion Table 1 mm = 0.039 inch	
f	
mm	inch
127	5.00
254	10.00



																	metric units		
Elesa Standards		Main dimensions														Mounting holes		C #	
Code	Description	f	d	A	B	C	H	L	e	l	l1	m	r	r1	d'-0.2	f'±0.2	[Nm]	g	
11141	HCX.127-E-NO-M12	127	M12	23	20	32	26	202	101	50	40	25	13	32.5	12.5	127	12	150	
11142	HCX.127-E-NC-M12	127	M12	23	20	32	26	202	101	50	40	25	13	32.5	12.5	127	12	150	
11145	HCX.254-E-NO-M12	254	M12	23	20	31	25	328	228	50	40	25	13	32.5	12.5	254	12	177	
11146	HCX.254-E-NC-M12	254	M12	23	20	31	25	328	228	50	40	25	13	32.5	12.5	254	12	177	

Maximum tightening torque.

Column level indicators
with MIN level and MAX
temperature electrical sensors



• **Material**

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters.

Avoid contact with alcohol or detergents containing alcohol.

• **Screw, nuts and washers**

Zinc-plated steel.

• **Packing rings**

NBR synthetic rubber O-Ring.

• **Float**

Polyamide based (PA) expanded technopolymer, black colour, with a built-in magnetic element to activate the electric contact when the oil level drops to a minimum; alarm threshold located at about 50 mm from the centre of the lower nut (in presence of mineral oil type CB68, according to ISO 3498, at 23°C).

• **Sensor bracket**

Watertight in polypropylene based (PP) technopolymer, black colour, with a built-in relay (reed) with two conductors wired to the two-pin connector.

For a correct assembly see Warnings.

• **MAX temperature electrical sensor (80°C)**

Zinc-plated screw with built-in sensor.

Temperature of intervention is 80°C.

• **Swivelling two-pin connectors**

With built-in cable glands and contact holders. Front or side output (right or left) including protection against water sprays (protection class IP 65 according to IEC 529 table, see Catalogue 062 Technical data page A25) that can be increased during installation with the necessary adjustments. Flat NBR synthetic rubber packing rings.

• **Contrast screen**

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN).

• **Standard executions**

- **HCX-E-ST-NO**: with electrical contact normally open.

- **HCX-E-ST-NC**: with electrical contact normally closed.

• **Assembly**

- By means of the supplied set screws and nuts.

- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

- By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $Ra = 3 \mu m$.

• **Maximum continuous working temperature**

90°C (with oil).

Special executions on request

- Level indicators for use with fluids containing alcohol.

- UV resistant transparent technopolymer indicators.

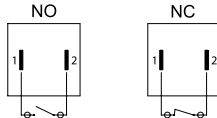
- Temperature electrical sensor with pre-set temperatures different from 80°C.

Features and performances

This column level indicator generates two electric signals: one when the oil goes down to the minimum level allowed and the other one when the temperature reaches the pre-set degrees (80°C).

Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up to 13 bar. If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.



Electric characteristics	MIN level sensor
Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage	NO: 150 Vac, 100 Vdc NC: 150 Vac, 150 Vdc
Maximum commutable opening capacity	1 A
Maximum bearable opening capacity	NO: 1A NC: 2A
Maximum commutable power	NO: 10 Va NC: 20 Va
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

Electric characteristics	MAX temperature sensor
Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage/opening capacity	250 Vac - 10 A (resistive loads) 48 Vdc - 5 A
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

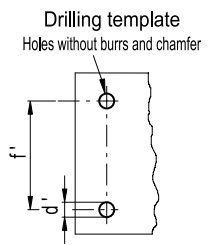
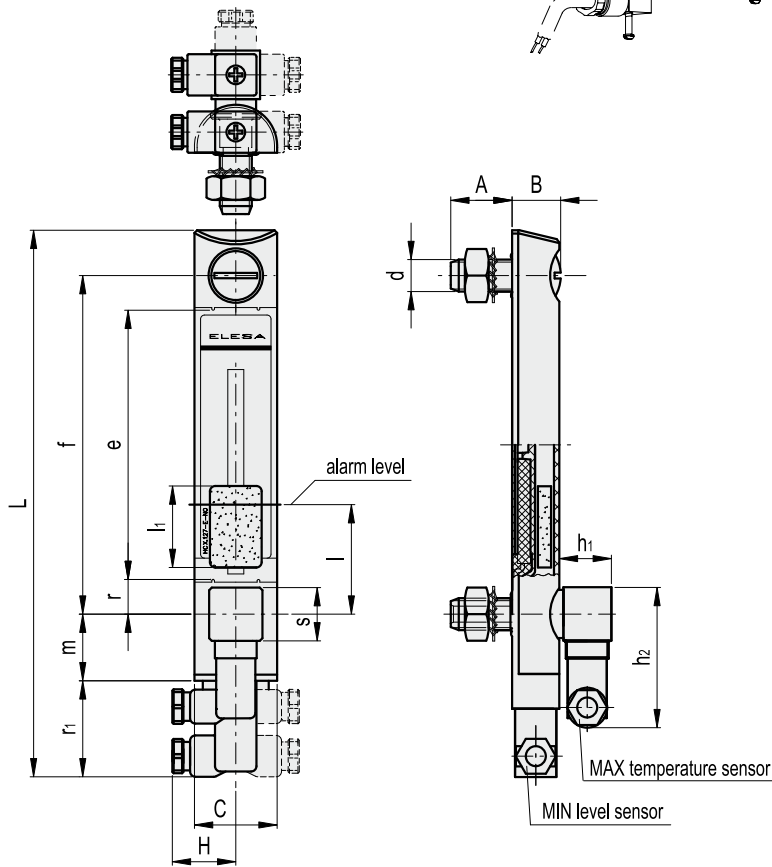
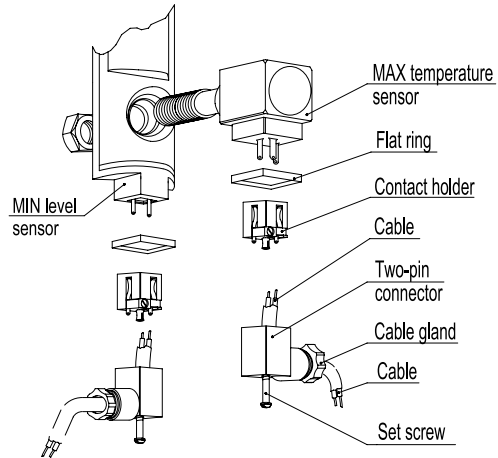
Do not mount this indicator in proximity to magnetic fields.

Functioning of the electrical sensors

- HCX-E-ST-NO with electrical contacts normally open. MIN level electrical sensor: the electrical circuit is closed when the minimum level is reached. MAX temperature electrical sensor: the electrical circuit is closed when the pre-set temperature at 80°C is reached.
- HCX-E-ST-NC with electrical contacts normally closed. MIN level electrical sensor: the electrical circuit is open when the minimum level is reached. MAX temperature electrical sensor: the electrical circuit is open when the pre-set temperature at 80°C is reached.

Two-pin connectors assembly instructions

1. Remove the connectors from the indicator by unscrewing the set screw placed in the bottom, take the contact holders out and loosen the cable glands.
2. Slip on the two-pole cable into the connectors (standard connectors) and connect the wires to the terminals nr. 1 and nr. 2 of the relative contact holders.
3. Assemble by pressing the contact holders into the relative connectors in the required position.
4. Screw the connectors to the indicator and then tighten the cable glands.



Conversion Table	
1 mm = 0.039 inch	
f	
mm	inch
127	5.00
254	10.00

Elesa Standards		Main dimensions																Mounting holes		C #	ΔΔ
Code	Description	f	d	A	B	C	H	L	e	l	l1	m	r	r1	h1	h2	s	d'-0.2	f±0.2	[Nm]	g
11151	HCX.127-E-ST-NO-M12	127	M12	23	20	31.5	25	202	101	50	40	25	13	32.5	21	54	22x22	12.5	127	12	235
11152	HCX.127-E-ST-NC-M12	127	M12	23	20	31.5	25	202	101	50	40	25	13	32.5	21	54	22x22	12.5	127	12	235
11153	HCX.254-E-ST-NO-M12	254	M12	23	20	31	25	328	228	50	40	25	13	32.5	21	54	22x22	12.5	254	12	262
11154	HCX.254-E-ST-NC-M12	254	M12	23	20	31	25	328	228	50	40	25	13	32.5	21	54	22x22	12.5	254	12	262

Maximum tightening torque.

Column level indicators with MIN level electrical sensor and temperature electrical probe



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.

• Screw, nuts and washers

Zinc-plated steel.

• Packing rings

NBR synthetic rubber O-Ring.

• Float

Polyamide based (PA) expanded technopolymer, black colour, with a built-in magnetic element to activate the electric contact when the oil level drops to a minimum; alarm threshold located at about 50 mm from the centre of the lower nut (in presence of mineral oil type CB68, according to ISO 3498, at 23°C).

• Sensor bracket

Watertight in polypropylene based (PP) technopolymer, black colour, with a built-in relay (reed) with two conductors wired to the two-pin connector. For a correct assembly see Warnings.

• Temperature electrical probe

Zinc-plated steel screw with built-in probe. The probe is made out of a platinum resistor whose ohmic resistance changes according to the temperature.

• Swivelling two-pin connectors

With built-in cable glands and contact holders. Front or side output (right or left) including protection against water sprays (protection class IP 65 according to IEC 529 table, see Catalogue 062 Technical data page A25) that can be increased during installation with the necessary adjustments. Flat NBR synthetic rubber packing rings.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN).

• Standard executions

- **HCX-E-STL-NO**: with electrical contact normally open.

- **HCX-E-STL-NC**: with electrical contact normally closed.

• Assembly

- By means of the supplied set screws and nuts.

- By means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls, if they are thick enough.

- By means of the supplied set screws and the Fast Mounting Kit (see page 89) when nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough.

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu m$.

• Maximum continuous working temperature

90°C (with oil).

Special executions on request

UV resistant transparent technopolymer indicators.

Features and performances

This column level indicator generates an electric signal when the oil goes down to the minimum level allowed and an analogic electric signal of the oil temperature.

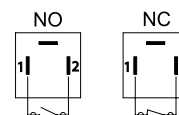
Technical data

In laboratory tests carried out with mineral oil type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up to 13 bar. If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Functioning of the MIN level electrical sensor

- **HCX-E-STL-NO**: the electrical circuit is closed when the minimum level is reached.

- **HCX-E-STL-NC**: the electrical circuit is open when the minimum level is reached.



Electric characteristics	MIN level sensor
Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage	NO: 150 Vac, 100 Vdc NC: 150 Vac, 150 Vdc
Maximum commutable opening capacity	1 A
Maximum bearable opening capacity	NO: 1A NC: 2A
Maximum commutable power	NO: 10 Va NC: 20 Va
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

Do not mount this indicator in proximity to magnetic fields.

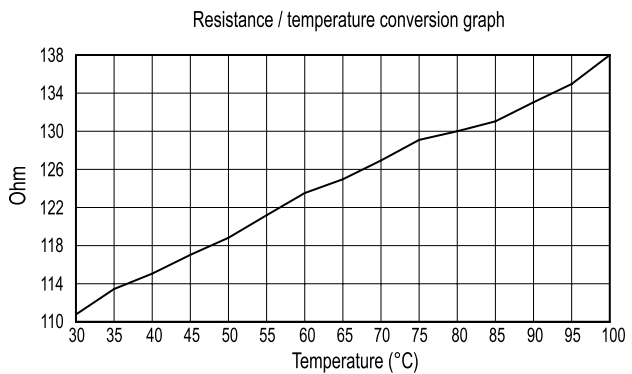


Electric characteristics	Temperature probe
Power supply	DC
Maximum applicable voltage	2 mA
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

Functioning of the temperature electrical probe

The working principle of the temperature probe is to measure the variation of resistance of a platinum element: 100 ohm = 0°C, 138.4 ohm = 100°C. The function between temperature (T) and resistance (R) is approximately linear over a small temperature range: for example, if you assume that it is linear over the 0° to 100°C range, the error at 50°C is 0.4°C. For precision measurement, it is necessary to linearise the resistance to give an accurate temperature. The most recent definition of the function between resistance and temperature is International Temperature Standard 90 (ITS-90).

The function between resistance and temperature, obtained in laboratory tests, measuring directly the resistance value on the contacts is shown in the graph.



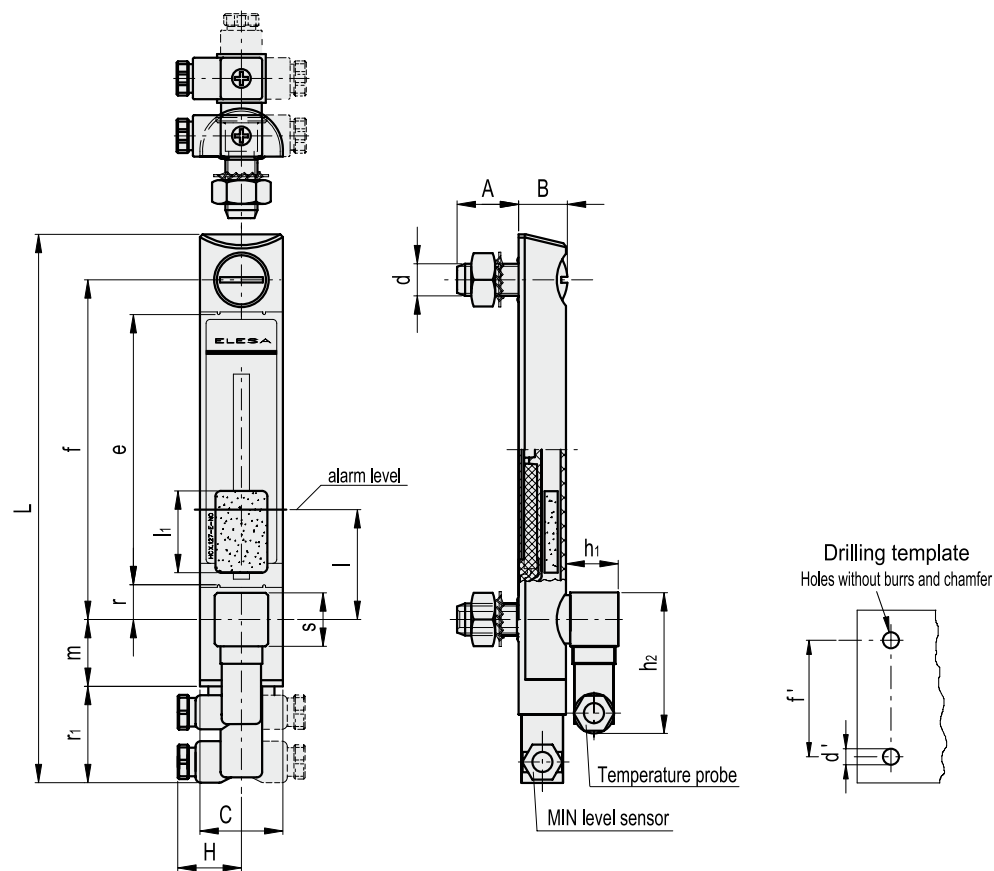
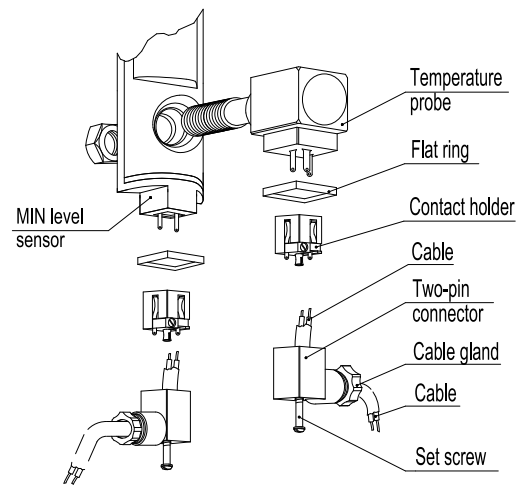
We suggest, anyway, to set the system in order to compensate both heat dissipation and cable resistance.

A 1°C temperature change will cause a 0.384 ohm change in resistance, so even a small error in measurement of the resistance (for example, the resistance of the wires leading to the sensor) can cause a large error in the measurement of the temperature.

Because of the low signal levels, it is important to keep any cables away from electric cables, motors, switchgear and other devices that may emit magnetic or electrical noise. Using screened cable, with the screen grounded at one end, may help to reduce interference. When using long cables, it is necessary to check that the measuring equipment is able to handle the cable resistance.

Two-pin connectors assembly instructions

- 1. Remove the connectors from the indicator by unscrewing the set screw placed in the bottom, take the contact holders out and loosen the cable glands.
- 2. Slip on the two-pole cable into the connectors (standard connectors) and connect the wires to the terminals nr. 1 and nr. 2 of the relative contact holders.
- 3. Assemble by pressing the contact holders into the relative connectors in the required position.
- 4. Screw the connectors to the indicator and then tighten the cable glands.



Conversion Table	
1 mm = 0.039 inch	
f	
mm	inch
127	5.00
254	10.00

																				metric units	
Elesa Standards			Main dimensions															Mounting holes		C #	ΔΔ
Code	Description	f	d	A	B	C	H	L	e	l	l1	m	r	r1	h1	h2	s	d'-0.2	f±0.2	[Nm]	g
11156	HCX.127-E-STL-NO-M12	127	M12	23	20	31.5	25	202	101	50	40	25	13	32.5	21	54	22x22	12.5	127	12	236
11157	HCX.127-E-STL-NC-M12	127	M12	23	20	31.5	25	202	101	50	40	25	13	32.5	21	54	22x22	12.5	127	12	236
11158	HCX.254-E-STL-NO-M12	254	M12	23	20	31	25	328	228	50	40	25	13	32.5	21	54	22x22	12.5	254	12	263
11159	HCX.254-E-STL-NC-M12	254	M12	23	20	31	25	328	228	50	40	25	13	32.5	21	54	22x22	12.5	254	12	263

Maximum tightening torque.

Column level indicators with MIN level electrical sensor



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters.

Avoid contact with alcohol or detergents containing alcohol.

• Screws

Nickel-plated brass with hexagon socket.

• Packing rings

NBR synthetic rubber O-Ring.

• Float

Polyamide based (PA) technopolymer, red colour, with a built-in magnetic element to activate the electric contact when the float reaches the minimum set at 40mm over the screw axis (dimension I).

• Sensor bracket

Watertight, black colour, with a built-in relay (reed).

For a correct assembly see Warnings.

• Connector

Right side output including protection against water sprays (protection class IP 65 according to IEC 529 table, see Catalogue 062 Technical data page A25).

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

• Standard executions

- **HCY-E-NO**: with electrical contact normally open
- **HCY-E-NC**: with electrical contact normally closed

• Maximum continuous working temperature

80°C (with oil).

Technical data

In laboratory tests carried out with mineral oil for hydraulic systems type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

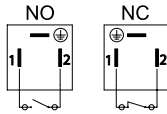
- HCY.76 14 bar
- HCY.127 9 bar
- HCY.254 8 bar

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESa Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Special executions on request

- Column level indicators in different materials (polycarbonate), for use with special fluids and/or at high temperatures.
- AISI 316 stainless steel or nickel-plated brass screws.
- Column level indicators with change-over electrical contact.



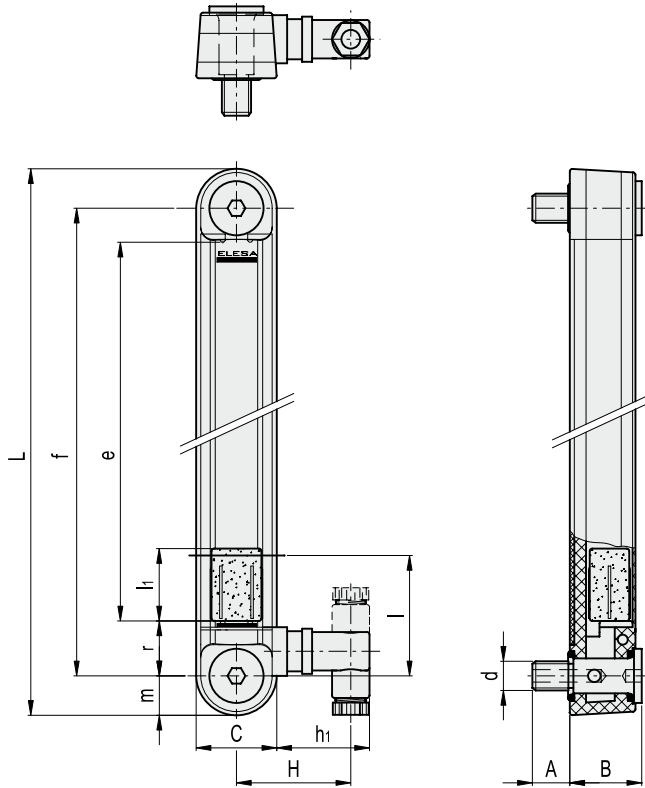
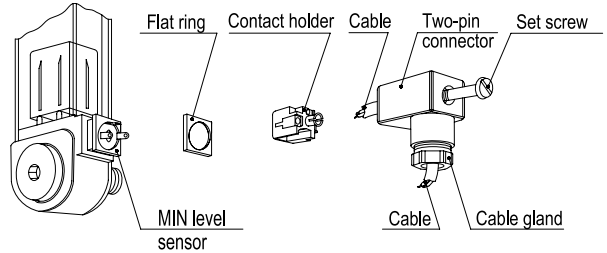


Electric characteristics	MIN level sensor
Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage	NO: 150 Vac, 150 Vdc NC: 230 Vac, 230 Vdc
Maximum commutable opening capacity	NO: 1A NC: 2A
Maximum commutable power	NO: 20 W / 20 V.A. NC: 40 W / 40 V.A.
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

Do not mount this indicator in proximity to magnetic fields.

Two-pin connector assembly instructions

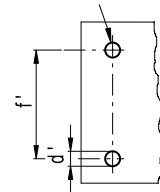
1. Remove the connector from the indicator by unscrewing the set screw placed in the bottom, take the contact holder out and loosen the cable gland.
2. Slip on the two-pole cable into the connector (standard connector) and connect the wires to the terminals nr. 1 and nr. 2 of the contact holder.
3. Assemble by pressing the contact holder into the connector in the required position.
4. Screw the connector to the indicator and then tighten the cable gland.



Conversion Table
1 mm = 0.039 inch

f	
mm	inch
76	2.99
127	5.00
254	10.00

Drilling template
Holes without burrs and chamfer



																	metric units		
Elesa Standards		Main dimensions														Mounting holes		C #	ΔΔ
Code	Description	f	d	A	B	C	H	h1	L	e	l	l1	m	r	d'-0.2	f±0.2	[Nm]	g	
111101	HCY.76-E-NO-M10	76	M10	15	29	32	46	37	108	41	40	17	16	20	10.5	76	12	150	
111102	HCY.76-E-NC-M10	76	M10	15	29	32	46	37	108	41	40	17	16	20	10.5	76	12	150	
111111	HCY.127-E-NO-M12	127	M12	15	29	32	46	37	159	93	40	29	16	20	12.5	127	12	170	
111112	HCY.127-E-NC-M12	127	M12	15	29	32	46	37	159	93	40	29	16	20	12.5	127	12	170	
111121	HCY.254-E-NO-M12	254	M12	15	29	32	46	37	286	219	40	29	16	20	12.5	254	10	215	
111122	HCY.254-E-NC-M12	254	M12	15	29	32	46	37	286	219	40	29	16	20	12.5	254	10	215	

Maximum tightening torque.

Column level indicators with MIN level and MAX temperature electrical sensors



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters.

Avoid contact with alcohol or detergents containing alcohol.

• Screws

Nickel-plated brass with hexagon socket.

• Packing rings

NBR synthetic rubber O-Ring.

• Float

Polyamide based (PA) technopolymer in red colour, with a built-in magnetic element to activate the electric contact when the oil level drops to the minimum set at 40mm over the screw axis (dimension I).

• MIN level electrical sensor

It generates an electric signal when the oil level reaches the minimum level.

The inside of the cavity where the sensor is contained is completely resinated in order to increase the thermal and electric insulation.

• Connector

Right side output, including a complete protection against water sprays (protection class IP 65 according to IEC 529 table, see Catalogue 062 Technical data page A25).

• MAX temperature electrical sensor (80°)

It is set at a standard intervention temperature of 80°C, placed close to a metallic plate which serves as a conductor of the heat of the fluid for a faster transmission and a lower dissipation. The inside of the cavity where the sensor is contained is completely resinated in order to increase the thermal and electric insulation.

For a correct assembly see Warnings.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

• Screw-covers

Polyamide based technopolymer, grey colour.

• Standard executions

- HCY-E-ST-NO: with electrical contact normally open.
- HCY-E-ST-NC: with electrical contact normally closed.

• Maximum continuous working temperature

80°C (with oil).

Technical data

In laboratory tests carried out with mineral oil for hydraulic systems type CB68 (according to ISO 3498) at 23°C for a limited period of time, the weld stood up as follows:

- HCY.76 14 bar
- HCY.127 9 bar
- HCY.254 8 bar

If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESa Technical Department. In any case we suggest to verify the suitability of the product under the actual working conditions.

Special executions on request

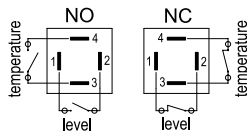
- Column level indicators in different materials (polycarbonate), for use with special fluids and/or at high temperatures.
- AISI 316 stainless steel or nickel-plated brass screws.
- Column level indicators with change-over electrical contact.
- Execution with PT100 temperature electrical probe for connection to PLC.
- Electrical sensors set at the following temperatures: 50°-60°-70°C.



Electric characteristics	MIN level sensor
Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage	NO: 150 Vac, 150 Vdc NC: 230 Vac, 230 Vdc
Maximum commutable opening capacity	NO: 1A NC: 2A
Maximum commutable power	NO: 20 W /20 V.A. NC: 40 W / 40 V.A.
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

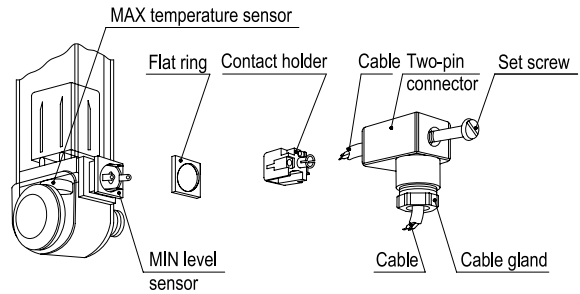
Electric characteristics	MAX temperature sensor
Power supply	AC/DC
Electric contacts	NO normally open NC normally closed
Maximum applicable voltage/ opening capacity	250 Vac - 10 A 60 Vdc - 3 A (resistive loads)
Cable gland	Pg 7 (for cables in sheath with Ø 6 o 7 mm)
Conductors cross-section	Max 1.5 mm ²

Do not mount this indicator in proximity to magnetic fields.

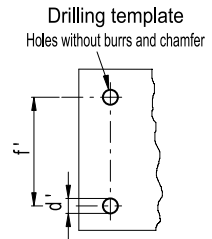
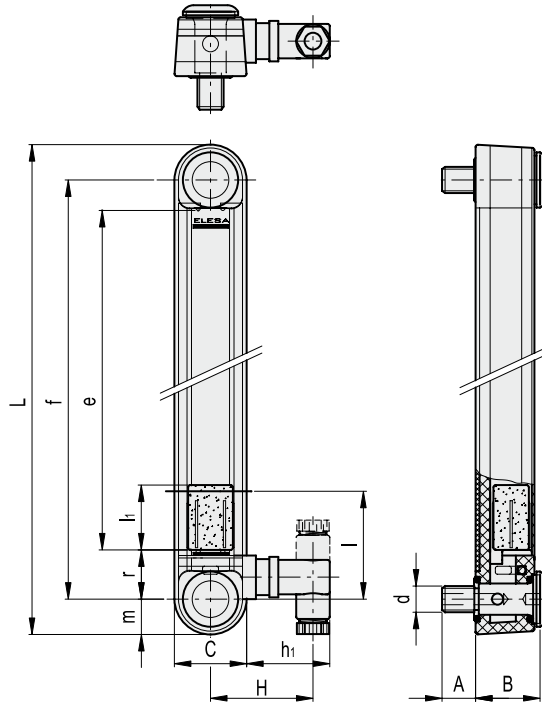




Two-pin connector assembly instructions

1. Remove the connector from the indicator by unscrewing the set screw placed in the bottom, take the contact holder out and loosen the cable gland.
2. Slip on the two-pole cable into the connector (standard connector) and connect the wires to the terminals nr. 1 and nr. 2 of the contact holder.
3. Assemble by pressing the contact holder into the connector in the required position.
4. Screw the connector to the indicator and then tighten the cable gland.



Conversion Table 1 mm = 0.039 inch	
f	
mm	inch
76	2.99
127	5.00
254	10.00



Elesa Standards		 Main dimensions														Mounting holes		C #	
Code	Description	f	d	A	B	C	H	h1	L	e	l	l1	m	r	d'-0.2	f±0.2	[Nm]	g	
111151	HCY.76-E-ST-NO-M12	76	M12	21	29	32	46	37	108	41	40	17	16	20	10.5	76	12	175	
111152	HCY.76-E-ST-NC-M12	76	M12	21	29	32	46	37	108	41	40	17	16	20	10.5	76	12	175	
111161	HCY.127-E-ST-NO-M12	127	M12	21	29	32	46	37	159	93	40	29	16	20	12.5	127	12	173	
111162	HCY.127-E-ST-NC-M12	127	M12	21	29	32	46	37	159	93	40	29	16	20	12.5	127	12	173	
111171	HCY.254-E-ST-NO-M12	254	M12	21	29	32	46	37	286	219	40	29	16	20	12.5	254	10	240	
111172	HCY.254-E-ST-NC-M12	254	M12	21	29	32	46	37	286	219	40	29	16	20	12.5	254	10	240	

HFL-E

Rapid levels with float



• Material

Polyamide-based technopolymer (PA), grey colour. Resistant to solvents, oils, greases and other chemicals.

• Packing rings

- TPE flat gasket (HFL-EF).
- NBR synthetic rubber O-Ring (HFL-ER).

• Connector with sensor block

Side output, grey colour, with a built-in reed switch. It offers protection class IP 65 according to UNI 529 (see Catalogue 062 Technical data page A25) table against water sprays.

For a correct assembly see Warnings.

• Dipstick

AISI 304 stainless steel tube, fastened to the body by a nickel-plated brass coupler.

• Float

NBR synthetic rubber.

• Standard executions

- **HFL-EF**: assembly by means of a flange with 3 holes at 120° for 3 zinc-plated steel screws with hexagon socket, supplied. It can be assembled also with 2 holes at 180°.

- **HFL-ER**: assembly by means of a 1" Gas threaded coupler.

• Maximum continuous working temperature

80°C.

Special executions on request

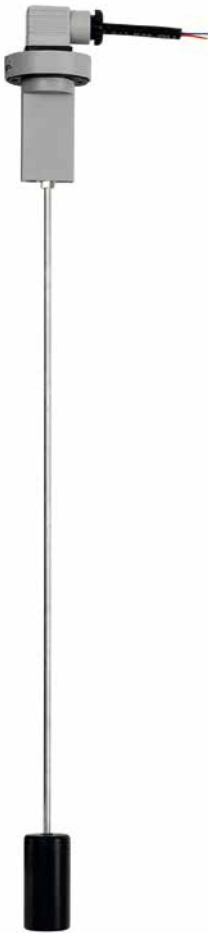
- Level indicators in different materials for use with particularly aggressive fluids and/or maximum working temperature up to 120°C.
- Dipsticks in different lengths and/or in AISI 316 stainless steel.
- Float with through holes to allow positioning according to different needs, avoiding cutting the dipstick.
- Double dipstick and double float manufactured for double minimum and maximum level reading.

Features and applications

HFL-E rapid levels show a minimum or maximum default level, according to the application needs.

Highly versatile, these rapid levels allow to define the most accurate set point by simply disassembling the dipstick float and cutting the dipstick exactly where needed, according to the specifications shown in the table. Free from magnetic parts, the float is integral to the dipstick making this level indicator ideal for use in tanks containing dirty liquids, water, oil, coolant oil, also with iron metal parts or foams. Moreover, the operation is independent of the fluid electrical conductivity.

To ensure utmost safety, the electrical components are separated from the tank and perfectly sealed by means of ultrasound welding.



Electric characteristics

Power supply	AC / DC
Electric contacts	NO normally open in the presence of liquid NC normally closed in the presence of liquid
Maximum commutable voltage	230 Vdc, 230 Vac
Maximum opening capacity	3 A
Commutable power	60 W 60 VA
Cable gland	Pg9 / Pg11 UNIFIED
Conductors cross-section	Max 1.5 mm ²

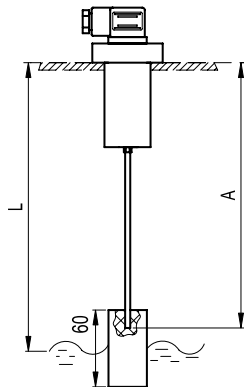


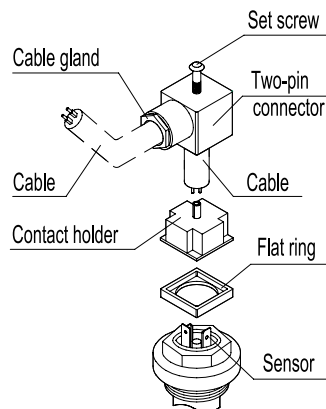
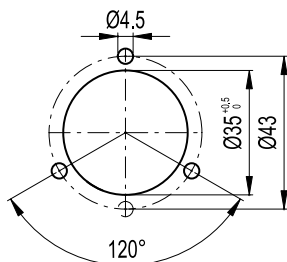
Table for cutting dipstick

Control quote L=(mm)	Dipstick cut quote for minimum level A=(mm)
120	116
140	137
160	158
180	179
200	200
220	221
240	242
260	263
280	284
300	305
320	326
340	347
360	368
380	389
400	410
420	431
440	452
460	473
480	494
500	515

Two-pin connectors assembly instructions

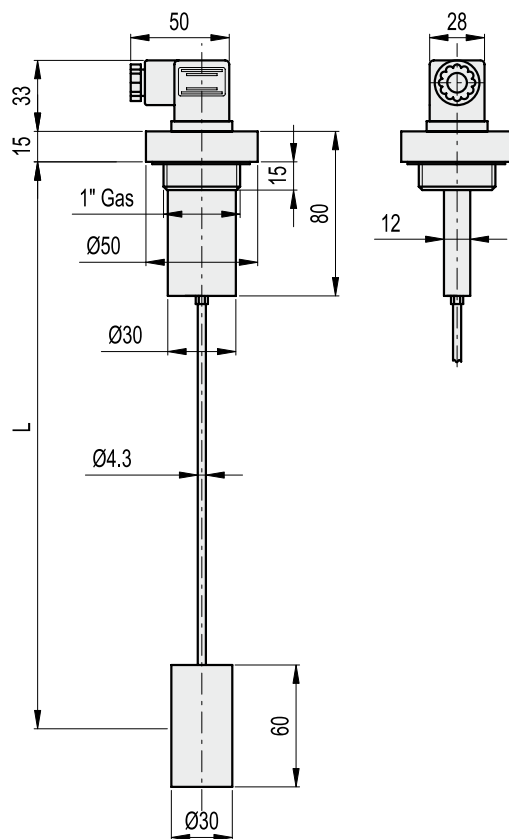
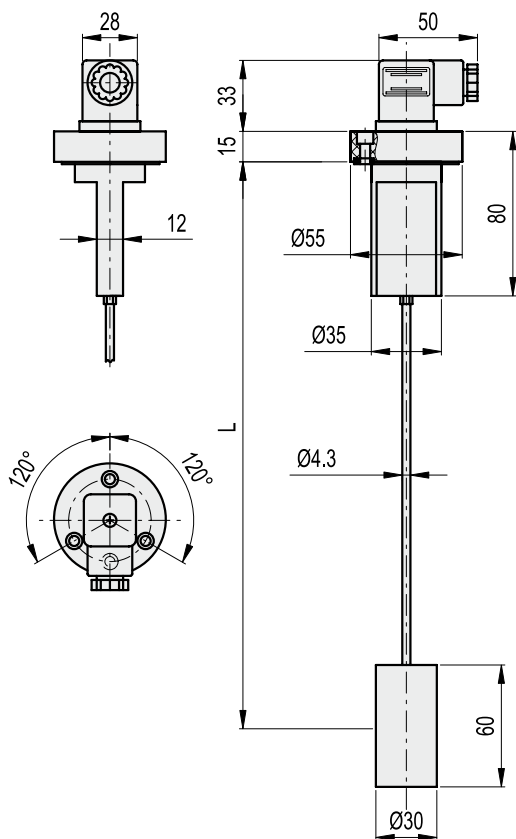
1. Remove the connectors from the indicator by unscrewing the set screw placed in the bottom, take the contact holders out and loosen the cable glands.
2. Slip on the two-pole cable into the connectors (standard connectors) and connect the wires to the terminals nr. 1 and nr. 2 of the relative contact holders.
3. Assemble by pressing the contact holders into the relative connectors in the required position.
4. Screw the connectors to the indicator and then tighten the cable glands.

Drilling template for HFL-EF



HFL-EF

HFL-ER



metric units

Elesa Standards		Main dimension		△△
Code	Description	L		g
111281	HFL-EF-NO	500		135
111283	HFL-EF-NC	500		135
111286	HFL-ER-NO	500		135
111288	HFL-ER-NC	500		135

HFLT-E

Rapid levels with float



• Material

Polyamide-based technopolymer (PA), grey colour. Resistant to solvents, oils, greases and other chemicals.

• Packing rings

- TPE flat gasket (HFLT-EF).
- NBR synthetic rubber O-Ring (HFLT-ER).

• Connector with sensor block

Side output, grey colour, with a built-in reed switch. It offers protection class IP 65 according to UNI 529 table (see Catalogue 062 Technical data page A25) against water sprays.

For a correct assembly see Warnings.

• Dipstick

Featuring two raised scales (oil and water) marking the exact cutting point so as to obtain the desired set point (dimension L).

• Standard executions

- **HFLT-EF**: assembly by means of a flange with 3 holes at 120° for 3 zinc-plated steel screws with hexagon socket, supplied, and a threaded coupler.
- **HFLT-ER**: assembly by means of a 1" Gas threaded coupler.

• Maximum continuous working temperature

80°C.

Special executions on request

- Polypropylene body (PP).
- With flange with 6 holes for fastening with cylindrical head screws (supplied), in addition to the threaded body.
- For use with maximum working temperature up to 120°C.

Features and applications

HFLT-E rapid levels detects a predefined minimum or maximum level, according to the application needs.

Highly versatile, these rapid levels allow to define both the most accurate set point required by simply disassembling the dipstick float and cutting the dipstick exactly where needed, and the kind of operation required, with normally open (NO) or normally closed (NC) contact in presence of liquid, by loosening the fastening nut on the opposite end of the dipstick and positioning the inner magnet according to specific requirements (refer to the adhesive label).

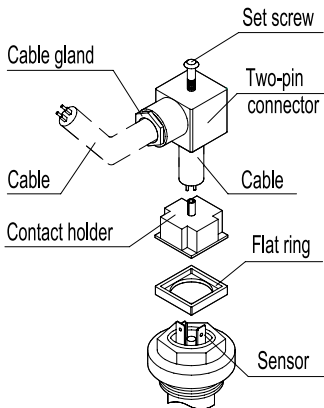
The magnet is generally supplied with normally open (NO) contact in presence of liquid.

Free from magnetic parts, the float is integral to the dipstick making this level indicator ideal for use in tanks containing dirty liquids, water, oil, coolant oil, also with iron metal parts or foams. Moreover, the operation is independent of the fluid electrical conductivity.

To ensure utmost safety, the electrical components are separated from the tank and perfectly sealed by means of ultrasound welding.

Two-pin connectors assembly instructions

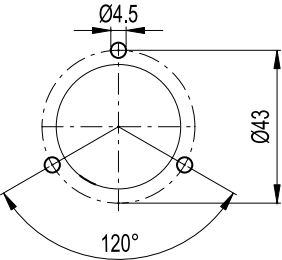
1. Remove the connectors from the indicator by unscrewing the set screw placed in the bottom, take the contact holders out and loosen the cable glands.
2. Slip on the two-pole cable into the connectors (standard connectors) and connect the wires to the terminals nr. 1 and nr. 2 of the relative contact holders.
3. Assemble by pressing the contact holders into the relative connectors in the required position.
4. Screw the connectors to the indicator and then tighten the cable glands.



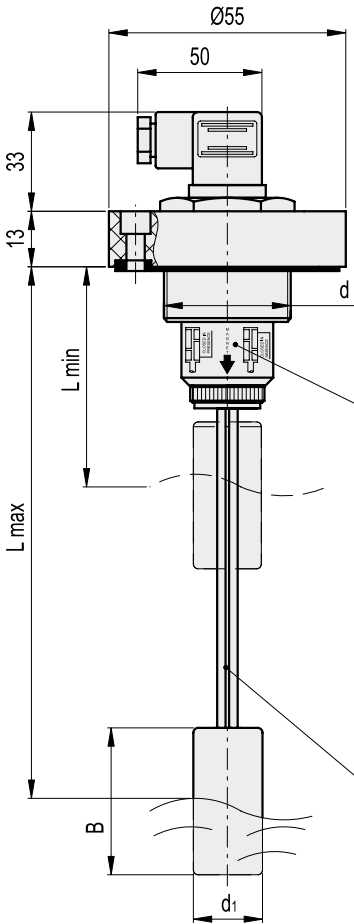
Electric characteristics

Power supply	AC / DC
Electric contacts	NO normally open in the presence of liquid NC normally closed in the presence of liquid
Maximum commutable voltage	230 Vdc, 230 Vac
Maximum opening capacity	2 A
Commutable power	40 W 40 VA
Cable gland	Pg9 / Pg11 UNIFIED
Conductors cross-section	Max 1.5 mm ²

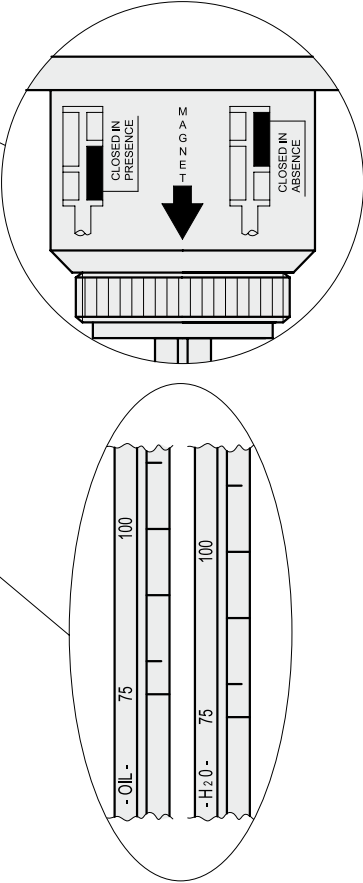
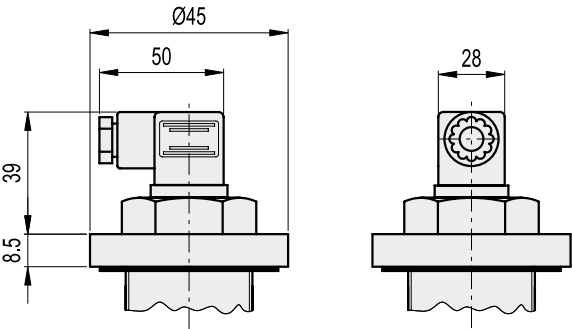
Drilling template for HFLT-EF



HFLT-EF



HFLT-ER



metric units

Elesa Standards		Main dimensions					ΔΔ
Code	Description	d	L min	L max	d1	B	g
111276	HFLT-EF-3/4	G 3/4	75	250	23	50	110
111278	HFLT-EF-1	G 1	85	360	30	60	110
111271	HFLT-ER-3/4	G 3/4	75	250	23	50	110
111273	HFLT-ER-1	G 1	85	360	30	60	110

TECHNICAL DATA INDEX

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1. Plastic Materials

DUROPLASTS: phenolic based (PF) thermosetting plastics that harden during moulding due to irreversible polymerization.

TECHNOPOLYMERS: thermoplastic polymer materials for technical use in which the chemical composition of the molecular chain provides a wide range of mechanical, thermal, and technological properties. The transformation process is based on the melting and subsequent hardening by solidification of the material in the mould. The material itself has a low environmental impact because it can be recycled (reversible solidification).

The main technopolymers used by ELESa						
PA	PA-T	PP	POM	PC	PBT	TPE
glass-fibre reinforced polyamide, with glass filler or glass micro-spheres or polyamide-based SUPER technopolymers	Special transparent polyamide	Glass-fibre reinforced polypropylene or with mineral fillers	Acetal resin	Special polycarbonate	Special polyester	Thermoplastic elastomer

1.1 Mechanical Strength

DUROPLASTS: the addition of mineral fillers, natural textile fibres and the optimum selection of the basic resin give this material an excellent mechanical strength, a high superficial hardness and a good impact strength.

TECHNOPOLYMERS: the rich selection of basic polymers available and the possibility of combining these with reinforcing fillers or additives of various kinds make a wide range of performance levels possible in terms of mechanical strength, impact strength, creep and fatigue.

The mechanical properties of a moulded plastic component may vary significantly according to its shape and the technological level of the manufacturing process.

For this reason, instead of providing tables containing specific data on the mechanical strength of test pieces of various types of material, ELESa has decided to inform designers of the forces which, in the most significant cases, may cause the component breakage. For most products, the mechanical strength values indicated in the catalogue are therefore loads at breakage.

The deformation under a load is not negligible for some products and may therefore jeopardise their performance, even before their breakage. Thus for these products, two load values are provided:

- **“maximum working load”** below which deformation DOES NOT jeopardise the component performance;
- **“load at breakage”** in accordance with the concepts outlined above.

In these cases, the “maximum working load” will be used as maximum design data to guarantee the correct performance, while the “load at breakage” will be used for safety tests.

Obviously, in both cases suitable safety coefficients must be applied.

Working stress has been taken into account (e.g. the transmission of torque in the case of a handwheel, the tensile strength in the case of a handle) as well as accidental stress (e.g. an impact with

the component), in order to provide designers with a reference for determining suitable safety coefficients, according to the type and importance of the application.

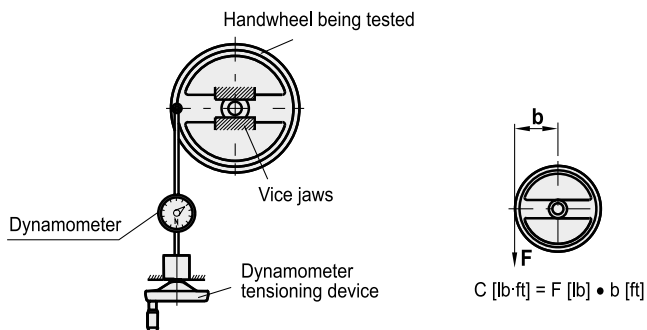
All the strength values supplied were obtained from tests carried out in ELESa Laboratories, under controlled temperature and humidity (73°F - Relative Humidity of 50%), under specific working conditions, and by applying a static load for a necessarily limited period of time.

The designer must therefore take into account adequate safety coefficients according to the application and specific operating conditions (vibrations, dynamic loads, working temperatures at the limits of the allowed temperature range). In the end, however, the designer is responsible for checking that the product is suitable for its intended purpose.

For some thermoplastics, for which the mechanical properties vary significantly in relation to the percentage of moisture absorbed (see chapter 1.5), the resistance tests on the component are carried out in compliance with ASTM D570, so that the moisture absorbed is in equilibrium with respect to ambient conditions of 73°F and a RH of 50%.

• **Resistance to transmission of torque** (working stress)

Use is made of an electronic dynamometer that applies increasing torque values as shown in the chart hereunder. The dynamometric system in the torque is shown in a traditional way to make the comprehension easier. The mean values of the torque C, obtained in the breaking tests, are shown in the tables for the various components and expressed in [lb·ft].



1.2 Thermal Resistance



The use of thermosetting materials and reinforced thermoplastic polymers with a high thermal resistance enables ELESa to obtain products with great thermal stability and a limited variation in their mechanical properties at both high and low temperatures.

The recommended operating temperature range for each plastic product in this catalogue is indicated by the symbol, which is shown here on the left.

Within this temperature range:

- the material is stable and no significant degradation takes place;
- the user does not normally encounter any problem with the basic performance of the product.

The mechanical strength, impact strength, maximum torque and maximum working pressure values indicated in the catalogue were obtained from tests carried out under laboratory conditions (73°F - Relative Humidity of 50%). These values may vary over the working temperature range indicated. Customers are therefore responsible for checking the product actual performance in their specific thermal working conditions. A very general indication, as to the working temperature range for the various types of plastics, is given in the table below.

Material	Working temperature range
Duroplasts (PF)	from -4°F to 212°/230°F
Special, high-resilience polypropylene based (PP) technopolymers	from 32°F to 176°/194°F
Glass-fibre reinforced polypropylene based (PP) technopolymers	from 32°F to 212°F
Polyamide based (PA) technopolymers	from -4°F to 194°F
Glass-fibre reinforced polyamide based (PA) technopolymers	from -22°F to 266°/302°F
Glass-fibre reinforced polyamide based (PA) technopolymers for high temperatures	from -22°F to 392°F

1.3 Strength and Surface Hardness

DUROPLASTS: the high surface hardness of the material and its glossy finish, obtained by the mould, enable the surfaces to be kept in perfect condition, even after prolonged use in the presence of metal machining residues or in abrasive environments, as for example, in metal machining applications with machine tools.

TECHNOPOLYMERS: the surface hardness values are lower than those of Duroplast, but are still within the 60-98 Rockwell range, M scale. Technopolymers are however tougher and have a greater impact strength than Duroplasts.

1.4 Resistance to Chemical Agents

The tables in Chapter 5 (pages 128 and 129) describe the resistance of the plastic materials used for ELESAs products, at an ambient temperature of 73°F, in the presence of the various chemical agents they may come into contact with, in an industrial environment (acids, bases, solvents, lubricants, fuels, and aqueous solutions) and indicate 3 classes of resistance:

- good resistance = the product functional and aesthetic properties remain unchanged;
- fair resistance = effects on the functional and/or aesthetic properties, depending on the type of product and the working conditions with some limitations of use according to the specific application;
- poor resistance = product susceptible to chemical aggression. Not recommended for use.

As a general rule, chemical resistance decreases as the working temperature and mechanical stresses, to which the product is subjected, increase.

The presence of high temperatures and high levels of mechanical stress together require the product resistance to chemical agents be tested.

1.5 Resistance to Atmospheric Agents and UV Rays

In most cases, ELESAs plastic Standards are used for "indoor" applications. In any case, due to the properties of the materials and the measures taken during the design stage, these products may also be used for "outdoor applications", where they are exposed to particular atmospheric conditions:

- **rapid changes in temperature:** within the working temperature range recommended for each product, rapid changes in temperature do not create problems due to the impact strength of the materials used;
- **the presence of water or moisture** may result in processes of hydrolysis and the absorption of a certain percentage of the water/moisture until a state of equilibrium is reached. This may alter some of the material's mechanical properties.

Examples of materials that absorb water include polyamides (PA), transparent polyamides (PA-T, and PA-T AR) and duroplasts (PF).

Products made of these materials may undergo slight changes in size due to the absorption of water, which may affect dimensional tolerances. During the design stage, ELESAs normally takes these possible variations into account in order to minimise their effects and to guarantee compliance with the technical specifications. The absorption of water results in a significant increase in impact strength.

The following polymers do not absorb water: polypropylene (PP), thermoplastic elastomers (TPE), and acetal resin (POM).

Occasional contact with rainwater followed by "drying" does not generally pose any problems in terms of the strength of the product.

When used in "outdoor" applications, it is advisable to prevent water accumulating on the product by adopting suitable assembly conditions.

- **Exposure to the sunlight and UV rays** in particular. Specific resistance tests have been carried out using specific equipment for accelerated ageing testing, in accordance with the ISO 4892-2 standard, and setting the following parameters:
 - radiation power: 550 [W]/[m]²;
 - internal temperature (Black Standard Temperature, BST): 149°F;
 - OUTDOOR filter that simulates exposure to the open air, with low shielding against UV rays;
 - relative humidity: 50%.

The relation between the hours of testing and the hours of actual exposure to an outdoor environment ("Equivalent Hours") obviously depends on the weather conditions of each geographic area. Taking the Average Radiant Exposure per Day (ARED) as a basis for comparison, the reference values adopted on an international scale include:

- Miami Equivalent Hours = high intensity exposure, typical of countries with a tropical or equatorial climate (ARED = 9.2 MJ/m²);
- Central Europe Equivalent Hours = mean intensity of exposure, typical of continental climates (ERMG=2 MJ/m²).

At the end of prolonged tests carried out at the ELESa laboratories, the variation in mechanical strength was measured (tensile/compression breaking, and impact breaking) was measured.

In general, the results show that the mechanical strength of polyamide (PA), polypropylene (PP) and Duroplast (PF) products is not significantly reduced by exposure to UV rays.

As to the aesthetic appearance of samples exposed to the action of the UV rays, in some cases a slight variation in the surface appearance of the product was found, on completion of the tests. For further details on UV ageing tests on specific products, contact the ELESa Technical Department.

1.6 Surface Finish and Cleanability

In moulding technopolymers, it is technically easier to make products with a rough matte surface finish, which hides any aesthetic defect such as shrinkage cavities, flow marks, or joining marks caused by non-optimum moulding processes.

However, a rough matte finish makes it more difficult to clean the component, especially if made out in light colours, and its handling for a long use.

ELESa technopolymer Standards have a very fine matte finish so that the product remains easy to clean in time, and it is easier for the user to handle it.

Some groups of technopolymer products have recently been developed with a completely glossy finish, so that they remain clean for a long time.

1.7 Compliance with International Standards

RoHS

Over the past few years, the national and international regulatory authorities have laid down a series of regulations for the control of substances that are harmful to man or the environment and for the environment safety management in the industrial field.

- **European Directive 2002/95/CE RoHS (Restriction of Hazardous Substances)** applicable to the field of electrical and electronic equipment. This provides for a gradual reduction in the heavy metals (Pb, Cd, Hg, and Cr6) and halogens (PBB and PBDE) present in the components used in the electrical and electronic industries.

In the data sheet of each product the "RoHS compliance" is indicated by the green symbol here on the side. The presence of this symbol means that all the technical problems related to the materials used for the chosen product have been solved out in compliance with the European Directive 2002/95/CE.

In practice, it could happen that the stock rotation process has not been completed yet: anyway, on elesa website www.elesa.com it is possible to make a check. ELESa Technical Department is always at the customer's disposal for any kind of assistance.

- **European Regulation n.1907/2006 - REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals)** applicable to all the chemical substances circulating in the European Community, aiming at improving the knowledge of the dangers and risks arising from the existing chemical substances and from the new ones.
- **European Directive 2000/53/CE - ELV (End Life of Vehicles)** applicable to the automotive field. This provides for a gradual reduction in the heavy metals Pb, Cd, Hg, and Cr6, present in vehicles.
- **RAEE (WEEE) Directive** - Waste of Electrical and Electronic Equipment.
- **ATEX Directive 94/9/CE - ATEX** effective since the 1st of July 2003, refers to work environments with explosion risks and classifies the zones where a potentially explosive atmosphere may occur.

ATEX marking (together with the declaration of conformity) certifies that the item, on which it is applied, was manufactured in compliance with all the requirements and provisions of the European Union Directive 94/9/EC (mandatory since 1st of July 2003) and that it was submitted to the procedures for conformity assessment.

In accordance with this directive, certification is compulsory for all the equipment and protection systems, for the components (which are necessary for operating in safe conditions) that will be used in potentially explosive atmospheres (either pneumatic, hydraulic, electrical, mechanical) and for all safety, control and adjustment devices needed for the safe operation of the equipment and the protection systems, installed out of the potentially explosive atmosphere, but having the function of protection against explosion risks.

Hazardous zones (are classified according to the frequency and duration of the occurrence of a potentially explosive atmosphere):

- **zone 0** area in which a potentially explosive atmosphere, consisting of a mixture of air and flammable substances in the form of gas, vapour or mist, is present always, for long periods or often (at least 1000 hours/year);
- **zone 1** area in which, during normal operations*, a potentially explosive atmosphere, consisting of a mixture of air and flammable substances in the form of gas, vapour or mist, is occasionally present or with a small frequency (more than 10 hours and less than 1000 hours/year);
- **zone 2** area in which, during normal operations*, a potentially explosive atmosphere, consisting of a mixture of air and flammable substances in the form of gas, vapour or mist, is present only for a short time or seldom (less than 10 hours/year);
- **zone 20** area in which a potentially explosive atmosphere in the form of a cloud of combustible dust in air is present always, often or for long periods (at least 1000 hours per year);

- **zone 21** area in which, during normal operations*, a potentially explosive atmosphere, in the form of a cloud of combustible dust in air is occasionally present or with a small frequency (more than 10 hours and less than 1000 hours/year);
- **zone 22** area in which, during normal operations*, a potentially explosive atmosphere, in the form of a cloud of combustible dust in air is present only for a short time or seldom (less than 10 hours/year).

* *normal operations means the situation in which installations are used within their design parameters.*

The directive identifies two groups of equipment (I and II), in accordance with the environment in which it is used:

- **group I** comprises equipment intended for use in the underground parts of mines, and/or in the surface parts of such mines;
- **group II** comprises equipment intended for use in environments other than those specified for group I.

Within group II, the devices subject to the provisions of ATEX directive are subdivided into categories according to the combination of explosion hazard zones and equipment groups:

- **category 1** comprises equipment and protection systems in this category are intended for use in areas in which explosive atmospheres are present for long periods or often (1000 hours or more/year), ensuring a very high level of protection;
- **category 2** comprises equipment and protection systems in this category are intended for use in areas in which, during normal operations, explosive atmospheres are present, with a small frequency or occasionally (10-1000 hours/year), ensuring a high level of protection;
- **category 3** comprises equipment and protection systems in this category are intended for use in areas in which, during normal operations, explosive atmospheres are present only for a short period or seldom (less than 10 hours/year), ensuring a normal level of protection.

ZONE	0 G (gas)	20 D (dust)	1 G (gas)	21 D (dust)	2 G (gas)	22 D (dust)
Explosive atmosphere	High probability, continuously or frequently		Average probability, sometimes, occasionally		Low probability, seldom, almost never	
CATEGORY in accordance to ATEX 94/9/EC Directive	1		2		3	

The directive also specifies the Groups of substances, classifying the substances that create potentially explosive atmospheres with air based on their hazardousness. The hazardousness depends on the gas ignition temperature.

The table below shows some examples of gases with their related classification.

Gas	Group
Propane	IIA
Ethylene	IIB
Acetylene	IIC

Equipment with IIB marking are suitable also for applications that require equipment of explosion group IIA, those marked with IIC are suitable also for applications that require equipment of explosion groups IIA and IIB.

The table below shows the temperature classes, that indicate the max surface temperature (detected on the surface of the piece into contact with air), that must not be exceeded, to prevent ignition.

Max surface temperature	Temperature class
842°F	T1
572°F	T2
392°F	T3
275°F	T4
212°F	T5
185°F	T6

Elesa products are components necessary for the safe operating of equipment and protection systems included in Group II (environments other than mines).

The following table shows the related categories:

Zone	0 (20)	1 (21)	2 (22)
Group II (environments other than mines)	Category 1 (presence of explosive atmosphere >1000 h/year)	Category 2 (presence of explosive atmosphere >10 and <1000 h/year)	Category 3 (presence of explosive atmosphere <10 h/year)

The following example shows the ATEX classification of an Elesa product, (a breather cap of the SFP series):

CE Ex II 2GD IIB T6

where:

- CE → marking CE
- Ex → protection against explosion symbol
- II → indicates the equipment group
- 2 → indicates the category it belongs to (and therefore the protection level ensured)
- G and D → indicate the type of potentially explosive atmosphere where the component can operate (G = gas, D = dust. They can be present alternatively or simultaneously (like in this case)
- IIB → indicates the substance group type (gas, vapours or mists)
- T6 → indicates the temperature class

k' protection factor: most of Elesa products included in the line of accessories for hydraulic systems are also certified according to EN 13463-8 standard (Protection by liquid immersion 'k'): the equipment protection is based on the presence of a liquid that prevents the formation of sparks and other causes of ignition.

The following example shows the ATEX classification of a certified Elesa product, e.g. a plug of the TN series, according to EN13463-8 standard, in which "k" is evidently present:

CE Ex II 2GD k T5.

Code	Description	Classification ATEX	Page
58296-EX	TN-3/8-EX	CE ex II 2GD kT5	7
58297-EX	TN-1/2-EX	CE ex II 2GD kT5	7
58298-EX	TN-3/4-EX	CE ex II 2GD kT5X	7
54001-EX	SFP30-3/8-EX	CE ex II 2GD IIB T6	38
54022-EX	SFP30-3/8+F FOAM-EX	CE ex II 2GD IIB T6	38
54101-EX	SFP30-1/2-EX	CE ex II 2GD IIB T6	38
54122-EX	SFP30-1/2+F FOAM-EX	CE ex II 2GD IIB T6	38
54201-EX	SFP40-3/4-EX	CE ex II 2GD IIB T6	38
54222-EX	SFP40-3/4+F FOAM-EX	CE ex II 2GD IIB T6	38
54011-EX	SFP30-3/8+a-EX	CE ex II 2GD IIB T6	39
54111-EX	SFP30-1/2+a-EX	CE ex II 2GD IIB T6	39
54211-EX	SFP40-3/4+a-EX	CE ex II 2GD IIB T6	39
14441-EX	HGFT.10-3/8-EX	CE ex II 2GD kT6X	59
14461-EX	HGFT.13-1/2-EX	CE ex II 2GD kT6X	59
14481-EX	HGFT.16-3/4-EX	CE ex II 2GD k IIB T6X	59
14446-EX	HGFT.10/SL-3/8-EX	CE ex II 2GD k IIB T6X	59
14466-EX	HGFT.13/SL-1/2-EX	CE ex II 2GD k IIB T6X	59
14486-EX	HGFT.16/SL-3/4-EX	CE ex II 2GD k IIB T6X	59
10851-EX	HCFE.12-3/8-EX	CE ex II 2GD kT6	75
10901-EX	HCFE.15-1/2-EX	CE ex II 2GD kT6	75
11001-EX	HCFE.20-3/4-EX	CE ex II 2GD k IIB T6	75
GN.37762	GN 743.6-11-M16x1.5	CE ex II 2GD TX	63
GN.37767	GN 743.6-14-M20x1.5	CE ex II 2GD TX	63
GN.37772	GN 743.6-18-M26x1.5	CE ex II 2GD TX	63
GN.37773	GN 743.6-18-M27x1.5	CE ex II 2GD TX	63
GN.37761	GN 743.6-11-G3/8	CE ex II 2GD TX	63
GN.37766	GN 743.6-11-G1/2	CE ex II 2GD TX	63
GN.37771	GN 743.6-18-G3/4	CE ex II 2GD TX	63

In an industrial environment, i.e. where ATEX Group II products are used, it is the user's responsibility to classify the zones in relation to the "potential" presence of gases, vapours and explosive dusts, identifying the relevant work places and working activities where explosion risks are present or could trigger, according to his/her risks assessment.

The manufacturer provides all the necessary information related to the Groups and Categories of the product, in order to allow the user to decide in which zone the ATEX product can safely operate, even if he/she is not able to foresee where and how it will actually operate.

1.9 Competence of ELESa Technical Department

Ongoing research and experimentation with new materials that offer increasingly high levels of performance are parts of the principles of continuous improvement on which Eles Quality System is based. Our partnership with the leading plastics manufacturers in the world and the use of mechanical and process simulation programs allow us to offer the material that best suits the Client's specific application.

2. Other Materials

GASKETS

ELESA normally uses gaskets made of synthetic nitrile butadiene rubber (NBR) or acrylonitrile butadiene rubber (BUNA N) for its products, with hardness values ranging from 70 to 90 SHORE A depending on the type of product considered.

The working temperature range for continuous use is -22°F to +248°F. Where a higher chemical and thermal resistance is required, that is, for products in the HCX-SST, HCX-SST-BW and HGFT.HT-PR series, gaskets made of FKM fluorinated rubber are used.

For chemical resistance values, see the tables in chapter 5 (on pages 128, 129 and 130).

The working temperature range is from -13°F to +410°F.

On request and for sufficient quantity, flat washers and O-rings made of special materials such as EPDM, silicone rubber, or others may be supplied.

AIR FILTERS for filler breather caps (SFN., SFP., SFV. and SFW. series):

- **TECH-FOAM type filters:** polyester-based polyurethane foam mesh, degree of filtration 40 microns, recommended for temperatures of between -40°F and +212°F for continuous use, and brief peak temperatures of +266°F. This material does not swell in contact with water, petrol, soap, detergents, mineral oils or grease. Some solvents may cause slight swelling of the foam (benzene, ethanol, and chloroform);
- **TECH-FIL type filters:** made of zinc-plated iron wire (quality as per DIN 17140-D9-W.N.R 10312, zinc-plated as per DIN 1548), degree of filtration 50-60 microns.

3. Special Executions

The range of ELESA elements is extremely broad and offers designers valid alternatives as regards designs, properties and performance of materials, sizes..., to satisfy the most different applicational needs. The customer may however need to ask for changes to the standard part or have it made in different colours to adapt it to particular applications. In these cases, ELESA engineers are at the customer's full disposal to satisfy these requests for special executions which must be required in sufficient quantities for the modifications they may entail to the moulds.

4. Test Values

All the information about the test values are based on our experience and on laboratory tests conducted under specific standard conditions and in a necessarily limited time.

Any indicated value must therefore be taken only as a reference for the designer who will apply adequate safety coefficients to them according to the product application.

The designer and the purchaser are responsible for checking the suitability of our products for their final use under the actual operating conditions.

5. Technical Tables

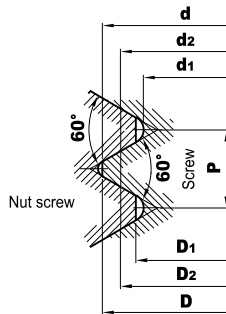
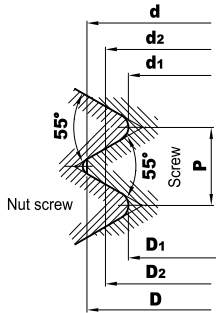
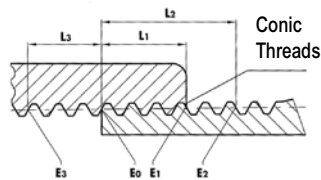
The units contained in the present catalogue, are those of the International System (S).
Conveniently, hereunder there is a list of the parameters converted into the units currently used or into the British ones.

CONVERSION TABLE OF THE MAJOR PARAMETERS			
Parameter	To convert	in to	multiply by
Force	N	kg	0.1
Torque	Nm	kg · m	0.1
Work	J	kg · m	0.1

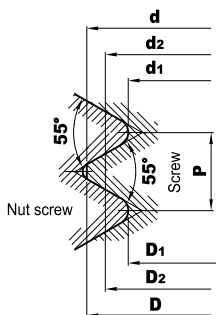
Parameter	To convert	in to	multiply by
Length	mm	inches	0.039
Force	N	lbf	0.224
Torque	Nm	lb · ft	0.737
Work	J	ft · lb	0.737
Weight	g	lb	0.002
Temperature	°C	°F	(°C · 9/5) + 32

CONVERSION TABLE OF SOME TEMPERATURE VALUES from °C to °F					
°C	°F	°C	°F	°C	°F
-50	-58	+50	+122	+150	+302
-45	-49	+55	+131	+155	+311
-40	-40	+60	+140	+160	+320
-35	-31	+65	+149	+165	+329
-30	-22	+70	+158	+170	+338
-25	-13	+75	+167	+175	+347
-20	-4	+80	+176	+180	+356
-15	+5	+85	+185	+185	+365
-10	+14	+90	+194	+190	+374
-5	+23	+95	+203	+195	+383
0	+32	+100	+212	+200	+392
+5	+41	+105	+221	+205	+401
+10	+50	+110	+230	+210	+410
+15	+59	+115	+239	+215	+419
+20	+68	+120	+248	+220	+428
+25	+77	+125	+257	+225	+437
+30	+86	+130	+266	+230	+446
+35	+95	+135	+275	+235	+455
+40	+104	+140	+284	+240	+464
+45	+113	+145	+293	+245	+473
+50	+112	+150	+302	+250	+482

°C = (°F-32) · 5/9
°F = (°C · 9/5) +32



$$P = \frac{25.4}{Z}$$



UNC-UNF THREADS (Thread limits, from ASME B1.1-89)

Threaded	Series designation	Screw medium tolerance Class 2A					Nut screw tolerance Class 2B			
		Ø major d		Ø pitch d2		Ø minor d1	Ø major D	Ø pitch D2		Ø minor D1
		max.	min.	max.	min.	max.	min.	min.	max.	min. max.
8-32	UNC	0.1631	0.1571	0.1428	0.1399	0.1259	0.1640	0.1437	0.1475	0.130 0.139
10-24	UNC	0.1890	0.1818	0.1619	0.1586	0.1394	0.1900	0.1629	0.1672	0.145 0.156
10-32	UNF	0.1891	0.1831	0.1688	0.1658	0.1519	0.1900	0.1697	0.1736	0.156 0.164
1/4"-20	UNC	0.2489	0.2408	0.2164	0.2127	0.1894	0.2500	0.2125	0.2224	0.196 0.207
5/16"-18	UNC	0.3113	0.3026	0.2752	0.2712	0.2452	0.3125	0.2764	0.2817	0.252 0.265
3/8"-16	UNC	0.3737	0.3643	0.3331	0.3287	0.2992	0.3750	0.3344	0.3401	0.307 0.321
1/2"-13	UNC	0.4985	0.4876	0.4485	0.4435	0.4069	0.5000	0.4500	0.4565	0.417 0.434
5/8"-11	UNC	0.6234	0.6113	0.5644	0.5689	0.5152	0.6250	0.5660	0.5732	0.527 0.546
3/4"-10	UNC	0.748	0.735	0.683	0.677	0.629	0.750	0.685	0.692	0.642 0.662

ISO METRIC THREADS (Thread limits for standard engagement lengths)

	P (mm)	Screw with tolerance of 6g						Nut screw with tolerance of 6H					
		Ø major d		Ø pitch d2		Ø minor d1		Ø major D		Ø pitch D2		Ø minor D1	
		max.	min.	max.	min.	max.	min.	min.	max.	min.	max.	min.	max.
M4	0.7	3.978	3.838	3.523	3.433	3.220	2.979	4.000		3.545	3.663	3.242	3.422
M5	0.8	4.976	4.826	4.456	4.361	4.110	3.842	5.000		4.480	4.605	4.134	4.334
M6	1	5.974	5.794	5.324	5.212	4.891	4.563	6.000		5.350	5.500	4.917	5.153
M8	1.25	7.972	7.760	7.160	7.042	6.619	6.230	8.000		7.188	7.348	6.647	6.912
M10	1.5	9.968	9.732	8.994	8.862	8.344	7.888	10.000		9.026	9.206	8.376	8.676
M12	1.75	11.966	11.701	10.829	10.679	10.072	9.543	12.000		10.863	11.063	10.106	10.441
M14	2	13.962	13.682	12.663	12.503	11.797	11.204	14.000		12.701	12.913	11.835	12.210
M16	2	15.962	15.682	14.663	14.503	13.797	13.204	16.000		14.701	14.913	13.835	14.210
M18	2.5	17.958	17.623	16.334	16.164	15.252	14.541	18.000		16.376	16.600	15.294	15.744
M20	2.5	19.958	19.623	18.344	18.164	17.252	16.541	20.000		18.376	18.600	17.294	17.744
M24	3	23.952	23.577	22.003	21.803	20.704	19.855	24.000		22.051	22.316	20.752	21.252
M30	3.5	29.947	29.522	27.674	27.462	26.158	25.189	30.000		27.727	28.007	26.211	26.771

Cylindrical GAS-BSP THREADS (Thread limits)

*	Z threads x 1"	Screw with tolerance of Classe B						Nut screw					
		Ø major d		Ø pitch d2		Ø minor d1		Ø major D		Ø pitch D2		Ø minor D1	
		max.	min.	max.	min.	max.	min.	min.	max.	min.	max.	min.	max.
G1/8"	28	9.728	9.514	9.147	8.933	8.566	8.298	9.728		9.147	9.254	8.566	8.848
G 1/4"	19	13.157	12.907	12.301	12.051	11.445	11.133	13.157		12.301	12.426	11.445	11.890
G 3/8"	19	16.662	16.408	15.806	15.552	14.950	14.632	16.662		15.806	15.933	14.950	15.395
G 1/2"	14	20.955	20.671	19.793	19.509	18.631	18.276	20.955		19.793	19.935	18.631	19.172
G 5/8"	14	22.911	22.627	21.749	21.465	20.587	20.232	22.911		21.749	21.891	20.587	21.128
G 3/4"	14	26.441	26.157	25.279	24.995	24.117	23.762	26.441		25.279	25.421	24.117	24.658
G 7/8"	14	30.201	29.917	29.039	28.755	27.877	27.522	30.201		29.039	29.181	27.877	28.418
G 1"	11	33.249	32.889	31.770	31.410	30.291	29.841	33.249		31.770	31.950	30.291	30.931
G 1 1/8"	11	37.897	37.537	36.418	36.058	34.939	34.489	37.897		36.418	36.598	34.939	35.579
G 1 1/4"	11	41.910	41.550	40.431	40.071	38.952	38.502	41.910		40.431	40.611	38.952	39.592
G 1 3/8"	11	44.323	43.963	42.844	42.484	41.365	40.915	44.323		42.844	43.024	41.365	42.005
G 1 1/2"	11	47.803	47.443	46.324	45.964	44.845	44.395	47.803		46.324	46.504	44.845	45.485
G 1 3/4"	11	53.746	53.386	52.267	51.907	50.788	50.338	53.746		52.267	52.447	50.788	51.428
G 2"	11	59.614	59.254	58.135	57.775	56.656	56.206	59.614		58.135	58.315	56.656	57.296

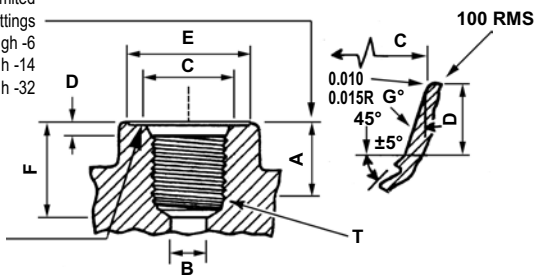
* G in accordance with UNI-ISO 228

NPT THREADS (Thread limits, from ASME B1-20)

Nominal Pipe Size	Threads per Inch.	Mean Ø of external threads beginning	Fit length		External threads length		Real internal threads length	
			Mean Ø		Mean Ø		Mean Ø	
1/4	18	0.477	0.227	0.491	0.401	0.502	0.166	0.467
3/8	18	0.612	0.24	0.627	0.407	0.637	0.166	0.601
1/2	14	0.758	0.32	0.778	0.533	0.791	0.214	0.745
3/4	14	0.967	0.339	0.988	0.545	1.001	0.214	0.954

Spotface depth limited
for wrench access on fittings
0.062 for -2 through -6
0.094 for -8 through -14
0.125 for -16 through -32

This surface must be
square to thread pitch
diameter within 0.010 FIR



- x Diameter "C" to be concentric with thread pitch diameter within 0.005 FM
- ▣ Requires bottoming tap
- ◊ Similar to AN-924 locknut
- ∞ Based on steel fitting and internal thread
- * Also minimum boss thickness
- + Only applies when tap drill cannot pass through entire boss

SAE O-RING PORT DIMENSIONS (O-RING BOSS) SAE STANDARD J514 (APR80)

Size		Port dimensions all dimensions are in inches except as noted										Fitting dimensions				
		Straight thread "T" SAE J475 (ISO R725)			A*	B+	C ^x	D	E	F [▣]	G	SAE HEX BOSS		◊ AND HEX BOSS		
Nominal tube od	Tube dash no.	"T" thread size	Thread pitch diam.	Thread minor diam.	Min. thread depth	Min. diam.	+0.005 -0.000 diam.	+0.015 -0.000	Min. diam.	Min.	± 1°	Across flats	Across corners	Across flats	Across corners	Arp 568 O-RING
1/2	-8	3/4-16 UNF-2B	0.7094 0.7159	0.682 0.696	0.562	0.391	0.811	0.100	1.188	0.688	15°	0.88	1.02	1.00	1.16	13/16 x 41/64 x 3/32
3/4	-12	1-1/16-12 UN-2B	1.0084 1.0158	0.972 0.990	0.750	0.609	1.148	0.130	1.625	0.906	15°	1.25	1.45	1.38	1.59	15/32 x 59/64 x 7/64

IP PROTECTION CLASSIFICATION FOR CASES according to International Standard IEC 529

1st digit Protection against intrusion of solid foreign bodies.			2nd digit Protection against penetration of liquids.		
0		No protection.	0		No protection.
1		Protection against intrusion of solid foreign bodies, Ø larger than 50 mm (hands).	1		Protection against drops of condensed water falling vertically.
2		Protection against intrusion of solid foreign bodies, Ø larger than 12 mm (fingers).	2		Protection against drops of liquid falling at an angle equal to or smaller than 15° with respect to the vertical.
3		Protection against intrusion of solid foreign bodies, Ø larger than 2.5 mm (tools, wires).	3		Protection against drops of liquid falling at an angle equal to or smaller than 60° with respect to the vertical.
4		Protection against intrusion of solid foreign bodies, Ø larger than 1 mm (wires).	4		Protection against liquid splashed from any direction.
5		Protection against harmful deposits of dust, which damage the correct operation.	5		Protection against water jets projected by a nozzle from any direction.
6		Complete protection against intrusion of dust.	6		Protection against water from heavy sea on ship's decks.
			7		Protection against immersion in water under stated conditions of pressure and time.
			8		Protection against indefinite immersion in water under stated conditions of pressure.

As a specification for cases of rotary controls does not exist, we refer to International Standard IEC 529 for protection classification of cases for electrical machines, devices or materials.

TECNOPOLYMERS AND RUBBERS

Resistance to chemical agents at 73°F temperature

Chemical agents and solvents	Polyamide (PA)			Transparent polyamide (PA-T)			Alcohol-Resistant transparent polyamide (PA-TAR)			Polypropylene (PP)			Polycarbonate (PC)			Rubber NBR			Flourated Rubber FKM		
	notes	%		notes	%		notes	%		notes	%		notes	%		notes	%		notes	%	
Acetic acid	Sol.	10	▲	Sol.	10	▲	Sol.	10	□		40	●	Sol.	10	●			▲			▲
Acetone		100	●			□			●			●			▲			▲			▲
Acrylonitrile		100	●			▲			▲									▲			▲
Aluminium chloride	Sol.	10	●			●			●			●			●	Sol.		●	Sol.		●
Aluminium sulphate	Sol.	10	●	Sol.	10	●	Sol.	10	●	Sol.	50	●			●	Sol.		●	Sol.		●
Ammonia gas			□			●			●			●						●			▲
Ammonia	Sol.	10	●	Sol.	10	●		10	●	Conc.		●			▲	Sol.		□	Sol.		▲
Ammonium chloride	Sol.	10	●	Sol.	10	●	Sol.	10	●			●			●	Sol.		●	Sol.		●
Amyl alcohol		100	●			▲			●			●			□			●			●
Aniline		100	□			▲			▲			●				Swell.		▲			●
Beer			●			●			●			●			●			●			●
Benzoic acid	Sol.	Sat.	□	Sol.	10	▲	Sol.	10	□		Sat.	●				Sol.		□	Sol.		●
Benzol/benzene		100	●			●			●			▲			s			▲			●
Boiling water	Swell.		□	Swell.		□	Swell.		□			●			●			□			□
Boric acid	Sol.	10	●			□			□		Sat.	●				Sol.		●	Sol.		●
Butter			●			●			●			●			●			●			●
Butyl acetate		100	●		100	●		100	●			●									●
Butyl alcohol		100	●			▲			●			●			●			●			●
Butylene glycol		100	●			▲			□									●			●
Calcium chloride	Sol.	10	●			●			●	Sol.	50	●			●	Sol.		●	Sol.		●
Carbon disulphide		100	●			□			●			▲						▲			●
Carbon tetrachloride			●			□			●			▲			▲			▲			●
Caustic potash	Sol.	5 - 10	●	Sol.	5 - 10	●	Sol.	5 - 10	●	Sol.	5 - 10	●				Sol.	5 - 10	□	Sol.	5 - 10	▲
Caustic potash	Sol.	50	□	Sol.	50	●	Sol.	50	●	Sol.	50	●				Sol.	50	▲	Sol.	50	▲
Chloroform		100	▲			▲			▲			▲			▲			▲			●
Citric acid	Sol.	10	□	Sol.	10	□	Sol.	10	□		10	●	Sol.	10	●	Sol.		●	Sol.		●
Copper sulphate	Sol.	10	●									●				Sol.			Sol.		●
Dichloropropane												□									
Distilled water			●			●			●			●			●			●			●
Edible fats			●			●			●									●			
Edible oils			●			●			●			●			●			●			●
Ethyl acetate		100	●		100	●		100	●			●			▲			▲			
Ethyl alcohol (ethanol)		96	●			▲			●		96	●			●			□			□
Ethyl Chloride		100	●			▲			▲			▲						●			●
Ethylene glycol			●			▲			□			●			●			●			●
Ethyl ether			●			●			●			●			▲			□			▲
Ferric chloride	Sol.	10	●			●			●			●			●	Sol.		●	Sol.		●
Formaldehyde (formalin)	Sol.		●	Sol.	40	□	Sol.	40	●	Sol.	40	●	Sol.	10	●	Sol.	40	□	Sol.	40	●
Formic acid	Sol.	10	▲	Sol.		▲	Sol.		▲	Sol.	10	●	Sol.	30	□	Sat.		▲	Sat.		▲
Freon 11												□						●			□
Freon 12	Liq.		●			●			●			□						●			□
Freon 13												□						●			●
Gas oil			●			●			●			●			●			●			●
Gasoline, vapor			●			●			●	Swell.		□						□			●
Glycerin			●			●			●			●			□			●			●
Green gasoline			●			●			●	Swell.		□			▲			□			●
Hydrochloric acid	Sol.	10	▲	Sol.	10	□	Sol.	10	□	Sol.	30	●	Sol.	10	●	Sol.	10	□	Sol.	10	●
Hydrofluoric acid	Sol.	40	▲	Sol.	10	▲	Sol.	10	▲	Sol.	40	●	Sol.	20	●		50	▲		50	●

*The characteristics described should be treated as guidelines only. No guarantee is made.
The exact conditions of use have to be taken into account individually.*

- = good resistance
 □ = fair resistance (limited use according to working conditions)
 ▲ = poor resistance (should not be used)
 Blanks stand for data not available

- Conc.** = concentration
Sol. = solution
Liq. = liquid
Sat. = saturated
Swell. = swelling

Chemical agents and solvents	Polyamide (PA)			Transparent polyamide (PA-T)			Alcohol-Resistant transparent polyamide (PA-TAR)			Polypropylene (PP)			Polycarbonate (PC)			Rubber NBR			Flourated Rubber FKM		
	notes	%		notes	%		notes	%		notes	%		notes	%		notes	%		notes	%	
Hydrogen peroxide	Sol.	3	▲	Sol.	3	▲	Sol.	3	▲		30	●	Sol.	30	●	Sol.	80	▲	Sol.	80	□
Iodine			▲			▲			▲			●			□						
Isopropyl alcohol (isopropanol)			●			▲			●			●			□			□			●
Kerosene			●			●			●			□			▲			●			●
Lactic acid	Sol.	10	●	Sol.	10	□	Sol.	10	□	Sol.	20	●	Sol.	10	●	Sol.		●	Sol.		●
Light petroleum			●			▲						●			□						
Linseed oil			●			●			●			●						●			●
Magnesium chloride	Sol.	10	●			●			●	Sol.	Sat.	●			●	Sol.		●	Sol.		●
Mercuric chloride	Sol.	6	▲									●									
Mercury			●			●			●			●			●			●			●
Methyl acetate		100	●		100	●		100	●												
Methyl alcohol		100	●			▲			●		100	●			▲			□			▲
Methylene chloride		100	●			▲			●			□			▲			▲			●
Methyl ethyl ketone			●			▲			▲			□			▲			▲			▲
Milk			●			●			●			●			●			●			●
Mineral oil			●			●			●			●			●			●			
Nitric acid		10	▲	Sol.	2	□	Sol.	2	□	Sol.	10	●	Sol.	20	□	Sol.	10	□	Sol.		□
Oleic acid		100	●			●			●	Sol.		●			●			□			
Paraffin oil			●			●			●			●			●			●			●
Petrol			●			●			●			□			●			●			●
Petrol			●			●			●			□			□	Swell.		□			●
Phenol	Sol.		▲			▲			▲			●			▲			▲			●
Phosphoric acid	Sol.	10	▲			▲			▲	Sol.	85	●	Sol.	10	●	Sol.	20	□	Sol.		●
Potassium nitrate	Sol.	10	●	Sol.	10	●	Sol.	10	●	Sat.		●			●			●			●
Sea water, river, drinking			●			●			●			●			●			●			●
Silicone oil			●			●			●			●			●			●			●
Silver nitrate			●	Sol.	10	●	Sol.	10	●	Sol.	20	●				Sol.		□			
Soap solution	Sol.		●	Sol.		●	Sol.		●	Sol.		●				Sol.		●	Sol.		●
Sodium carbonate	Sol.	10	●			●			●	Sol.	Sat.	●				Sol.		●	Sol.		
Sodium chloride	Sol.		●	Sol.	25	●	Sol.	25	●	Sol.	Sat.	●			●	Sol.		●	Sol.		●
Sodium hydroxide	Sol.	5 - 10	●	Sol.	5 - 10	●	Sol.	5 - 10	●	Sol.	5 - 10	●				Sol.	5 - 10	□	Sol.	5 - 10	▲
Sodium hydroxide	Sol.	50	□	Sol.	50	●	Sol.	50	●	Sol.	50	●				Sol.	50	▲	Sol.	50	▲
Sodium hypochlorite	Sol.		●			▲			▲	Sol.	20	●	Sol.	5	●	Sol.	10	▲	Sol.	10	▲
Sodium nitrate	Sol.	10	●	Sol.	10	●	Sol.	10	●			●			▲			●			●
Sodium silicate			●									●									
Sodium sulphate	Sol.	10	●	Sol.	10	●	Sol.	10	●			●			●	Sol.		●	Sol.		●
Sulfuric acid	Sol.	10	▲	Sol.	2	●	Sol.	2	●		98	●	Sol.	50	●	Sol.	20	□	Sol.	20	●
Tartaric acid			●	Sol.		□	Sol.		□	Sol.	10	●				Sol.		●	Sol.		●
Tetralin			●			●			●			▲			▲			▲			●
Toluol/toluene			●			●			●			□			▲			▲			□
Transformer oil			●			●			●			□						●			●
Trichlorethylene (Trichloroethylene)			□			●			●			▲			▲			▲			□
Vaseline			●			●			●			●			●			●			●
Vinegar												●			●			□			□
Water vapor			●			●			●			●						□			●
Whisky			●			□			●			●			●			●			●
Wine			●			●			●			●			●			●			●
Xylene			●			●			●			▲			▲			▲			●
Zinc chloride			□	Sol.	50	●	Sol.	50	●	Sol.	20	●			●	Sol.		●	Sol.		●

The characteristics described should be treated as guidelines only. No guarantee is made.
 The exact conditions of use have to be taken into account individually.

ELASTOMERS (rubber)

International symbol	NBR	CR	FKM - FPM	TPE	PUR
Brand name (e.g.)	Perbunan®	Neoprene®	Viton®	SANTOPRENE®	Bayflex®
Chemical name	Acrylonitrile-butadiene Rubber	Chloroprene Rubber	Fluorine Rubber	Thermoplastic Rubber	Polyurethane
Hardness (Shore A)	from 25 to 95	from 30 to 90	from 65 to 90	from 55 to 87	from 65 to 90
Temperature resistance					
short-term	from -40° to +302°F	from -22° to +302°F	from -22° to +280°C	from -40° to +302°F	from -40° to +266°F
long-term	from -22° to +248°F	from -4° to +248°F	from -4° to +446°F	from -22° to +257°F	from -25° to +212°F
Tensile strength [N/mm ²]	25	25	20	8.5	20
Wear / Abrasion resistance	good	good	good	good	excellent
Resistance to:					
oil, grease	outstanding	good	good	good	very good
solvents	good in part	good in part	very good	outstanding	satisfactory
acids	restricted	good	very good	outstanding	non adatta
caustic solutions	good	very good	very good	outstanding	non adatta
fuels	good	slight	outstanding	good	good
General	NBR synthetic rubber resistance to swelling when in contact with oils and fuels. Standard material for O-rings.	CR synthetic rubber excellent resistance to ageing, atmospheric and environmental influences	FPM resistance to contact with fuels, oils, solvents, acids, caustic solutions and to atmospheric and environmental influences. High price, to be used for applications under severe conditions.	SANTOPRENE ® thermoplastic rubber, its performances are comparable to those of many customary vulcanised special rubbers. SANTOPRENE ® outstanding dynamic fatigue life, excellent resistance to ozone and to atmospheric and environmental influences.	PUR excellent mechanical characteristics, resistance to atmospheric and environmental influences. Extreme resistance to wear and tear.

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Viton® is registered trade-mark by DuPont Dow Elastomer.
Neoprene® is registered trade-mark by DuPont SBR.
SANTOPRENE® is registered trade-mark by Advanced Elastomer Systems.

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9101	FRF+C	54	11356	HCX.127/T-M12	82	13771	HFTX.31-M40x1.5	73	39525	MH.26-C	8
9201	FRB+C	55	11357	HCX.127/T-AR-M12	86				39527	MH.32-C	8
			11358	HCX.127/T-SST-M12	84	14441	HGFT.10-3/8*	58	39529	MH.38-C	8
10751	HRT.15-26	70	11361	HCX.254-M12	82	14441-EX	HGFT.10-3/8-EX	59	39541	MH.19-S	8
10756	HRT.20-32	70	11362	HCX.254-AR-M12	86	14444	HGFT.10-3/8*	58	39543	MH.22-S	8
10761	HRT.25-38	70	11363	HCX.254-SST-M12	84	14446	HGFT.10/SL-3/8	58	39545	MH.26-S	8
10766	HRT.40-60	70	11364	HCX.254-LT-M12	88	14446-EX	HGFT.10/SL-3/8-EX	59	39547	MH.32-S	8
10781	HRT.25/T-38	70	11365	HCX.254-BW-SST-M12	87	14461	HGFT.13-1/2*	58	39549	MH.38-S	8
10786	HRT.40/T-60	70	11366	HCX.254/T-M12	82	14461-EX	HGFT.13-1/2-EX	59			
10851	HCFE.12-3/8	74	11367	HCX.254/T-AR-M12	86	14462	HGFT.13/PR-1/2-C9	68	49401	PLRB+C	57
10851-EX	HCFE.12-3/8-EX	75	11368	HCX.254/T-SST-M12	84	14463	HGFT.13/HT-PR-1/2	69	49411	PLRF+C	56
10901	HCFE.15-1/2	74	11371	HCX.127-P-M12	83	14464	HGFT.13-1/2*	58			
10901-EX	HCFE.15-1/2-EX	75	11376	HCX.127/T-P-M12	83	14466	HGFT.13/SL-1/2	58	52801	SFC.30-3/8+F	26
10906	HCFE.15/C-1/2	75	11382	HCZ.76	79	14466-EX	HGFT.13/SL-1/2-EX	59			
			11383	HCZ.76/T	79	14481	HGFT.16-3/4*	58	53901	SFN.30-3/8	28
11001	HCFE.20-3/4	74	11385	HCZ.127	79	14481-EX	HGFT.16-3/4-EX	59	53911	SFN.30-1/2	28
11001-EX	HCFE.20-3/4-EX	75	11386	HCZ.127/T	79	14482	HGFT.16/PR-3/4-C9	68	53921	SFN.40-3/4	28
11006	HCFE.20/C-3/4	75	11388	HCZ.254	79	14483	HGFT.16/HT-PR-3/4	69	53931	SFN.40-1	28
11101	HCFE.24-1	74	11389	HCZ.254/T	79	14484	HGFT.16-3/4*	58	53932	SFN.57-1¼	28
11106	HCFE.24/C-1	75	11392	HCZ.76-P	79	14486	HGFT.16/SL-3/4	58	53933	SFN.57-1½	28
11111	HCFE.30-1¼	74	11393	HCZ.76/T-P	79	14486-EX	HGFT.16/SL-3/4-EX	59	53935	SFP.30-1/4	32
11141	HCX.127-E-NO-M12	101	11395	HCZ.127-P	79	14521	HGFT.21-1*	58	53936	SFP.30-1/4+a	36
11142	HCX.127-E-NC-M12	101	11396	HCZ.127/T-P	79	14522	HGFT.21/PR-1-C9	68	53937	SFP.30-1/4+FIL	33
11145	HCX.254-E-NO-M12	101	11398	HCZ.254-P	79	14523	HGFT.21/HT-PR-1	69	53938	SFP.30-1/4+FOAM	33
11146	HCX.254-E-NC-M12	101	11399	HCZ.254/T-P	79	14524	HGFT.21-1*	58	53939	SFP.30-1/4+F+a	37
11151	HCX.127-E-ST-NO-M12	103	11401	HE.17	71	14526	HGFT.21/SL-1	58	53941	SFP.30-16x1.5	32
11152	HCX.127-E-ST-NC-M12	103	11501	HE.20	71	14541	HGFT.25-1¼*	58	53946	SFP.30-16x1.5+a	36
11153	HCX.254-E-ST-NO-M12	103	11601	HE.26	71	14542	HGFT.25/PR-1¼-C9	68	53951	SFP.30-16x1.5+FIL	33
11154	HCX.254-E-ST-NC-M12	103	11701	HE.30	71	14544	HGFT.25-1¼*	58	53952	SFP.30-16x1.5+FOAM	33
11156	HCX.127-E-STL-NO-M12	105	11801	HE.35	71	14546	HGFT.25/SL-1¼	58	53956	SFP.30-16x1.5+F+a	37
11157	HCX.127-E-STL-NC-M12	105	11901	HE.40	71	14561	HGFT.40-2*	58	53961	SFP.30-18x1.5	32
11158	HCX.254-E-STL-NO-M12	105				14564	HGFT.40-2*	58	53966	SFP.30-18x1.5+a	36
11159	HCX.254-E-STL-NC-M12	105	12001	HE.45	71	14566	HGFT.40/SL-2	58	53971	SFP.30-18x1.5+FIL	33
11161	HCX.127-ST-NO-M12	97				14991	GH. 1/4	71	53972	SFP.30-18x1.5+FOAM	33
11162	HCX.127-ST-NC-M12	97	13651	HFTX.9-1/4	73				53976	SFP.30-18x1.5+F+a	37
11166	HCX.127-STL-M12	99	13652	HFTX.9/PR-1/4	74	15001	GH. 3/8	71	53981	SFP.30-20x1.5	32
11171	HCX.254-ST-NO-M12	97	13661	HFTX.11-M16x1.5	73	15011	GH. 1/2	71	53983	SFP.30-20x1.5+a	36
11172	HCX.254-ST-NC-M12	97	13671	HFTX.12-3/8	73	15021	GH. 3/4	71	53986	SFP.30-20x1.5+FIL	33
11176	HCX.254-STL-M12	99	13672	HFTX.12/PR-3/8	74	15031	GH. 1	71	53987	SFP.30-20x1.5+FOAM	33
11341	HCX.76-M10	82	13681	HFTX.14-M20x1.5	73	15041	GH. 1¼	71	53989	SFP.30-20x1.5+F+a	37
11342	HCX.76-AR-M10	86	13691	HFTX.15-1/2	73	15051	GH. 2	71	53991	SFP.30-22x1.5	32
11343	HCX.76-SST-M10	84	13692	HFTX.15/PR-1/2	74				53993	SFP.30-22x1.5+a	36
11345	HCX.76-BW-SST-M10	87	13701	HFTX.18-M25x1.5	73	31801	FM-HCX.76-M10-KIT	89	53996	SFP.30-22x1.5+FIL	33
11346	HCX.76/T-M10	82	13711	HFTX.19-M27x1.5	73	31811	FM-HCX.127-254-M12-KIT	89	53997	SFP.30-22x1.5+FOAM	33
11347	HCX.76/T-AR-M10	86	13721	HFTX.20-3/4	73				53999	SFP.30-22x1.5+F+a	37
11348	HCX.76/T-SST-M10	84	13722	HFTX.20/PR-3/4	74	39501	MH.19-N	8			
11349	HCX.127-M10	82	13726	HFTX.21-M26x1.5	73	39503	MH.22-N	8	54001	SFP.30-3/8	32
11351	HCX.127-M12	82	13731	HFTX.22-M30x1.5	73	39505	MH.26-N	8	54001-EX	SFP.30-3/8-EX	38
11352	HCX.127-AR-M12	86	13741	HFTX.24-1	73	39507	MH.32-N	8	54011	SFP.30-3/8+a	36
11353	HCX.127-SST-M12	84	13742	HFTX.24/PR-1	74	39509	MH.38-N	8	54011-EX	SFP.30-3/8+a-EX	39
11354	HCX.127/T-M10	82	13751	HFTX.26-M35x1.5	73	39521	MH.19-C	8	54021	SFP.30-3/8+FIL	33
11355	HCX.127-BW-SST-M12	87	13761	HFTX.30-1¼	73	39523	MH.22-C	8	54022	SFP.30-3/8+FOAM	33

CODE	DESCRIPTION	PAGE	CODE	DESCRIPTION	PAGE	CODE	DESCRIPTION	PAGE	CODE	DESCRIPTION	PAGE
54022-EX	SFP.30-3/8+F-EX	38	54711	SFN.70-1¼+F	29	56742	SFP.57-1+FOAM	33	58563	TCD.22x1.5	10
54031	SFP.30-3/8+F+a	37	54731	SFN.70-BA+F	29				58565	TCD.25x1.5	10
54101	SFP.30-1/2	32	54761	SFN.70-PF+F	35	57101	T.240-1/4	22	58567	TCD.35x1.5	10
54101-EX	SFP.30-1/2-EX	38	54801	SFW.57-3/4+F-350mb	44	57111	T.240-1/4+a	22	58569	TCD.26x1.5	10
54111	SFP.30-1/2+a	36	54851	SFP.70-3/4+FOAM	33	57201	T.240-3/8	22	58571	TCD.40x1.5	10
54111-EX	SFP.30-1/2+a-EX	39	54853	SFP.70-3/4+F+a	37	57211	T.240-3/8+a	22	58591	TCD.1/8	10
54121	SFP.30-1/2+FIL	33	54861	SFP.70-1¼+FOAM	33	57301	T.240-1/2	22	58601	TCD.1/4	10
54122	SFP.30-1/2+FOAM	33	54863	SFP.70-1¼+F+a	37	57311	T.240-1/2+a	22	58611	TCD.3/8	10
54122-EX	SFP.30-1/2+F-EX	38	54876	SFP.70-2	32	57401	T.240-3/4	22	58621	TCD.1/2	10
54131	SFP.30-1/2+F+a	37	54877	SFP.70-2+a	36	57411	T.240-3/4+a	22	58631	TCD.3/4	10
54201	SFP.40-3/4	32	54878	SFP.70-2+FOAM	33	57601	T.240-1	22	58641	TCD.1	10
54201-EX	SFP.40-3/4-EX	38	54879	SFP.70-2+F+a	37	57611	T.240-1+a	22	58643	TCD.1¼	10
54211	SFP.40-3/4+a	36	54881	SFP.70-BA+FOAM	33	57801	T.240-1¼	22	58645	TCD.1½	10
54211-EX	SFP.40-3/4+a-EX	39	54883	SFP.70-BA+F+a	37	57811	T.240-1¼+a	22	58651	TCDF.10x1.5	10
54221	SFP.40-3/4+FIL	33	54911	SFW.70-3/4+F-350mb	44	57901	T.240-1½	22	58653	TCDF.12x1.5	10
54222	SFP.40-3/4+FOAM	33	54913	SFW.70-3/4+F+a-350mb	45	57911	T.240-1½+a	22	58655	TCDF.14x1.5	10
54222-EX	SFP.40-3/4+F-EX	38	54921	SFW.70-1¼+F-350mb	44				58657	TCDF.16x1.5	10
54231	SFP.40-3/4+F+a	37	54923	SFW.70-1¼+F+a-350mb	45	58001	T.270-1/2	24	58659	TCDF.18x1.5	10
54301	SFP.40-1	32	54931	SFW.70-2+F-350mb	44	58011	T.270-3/4	24	58661	TCDF.20x1.5	10
54311	SFP.40-1+a	36	54941	SFW.70-BA+F-350mb	44	58021	T.270-1	24	58663	TCDF.22x1.5	10
54321	SFP.40-1+FIL	33	54943	SFW.70-BA+F+a-350mb	45	58031	T.270-1¼	24	58665	TCDF.25x1.5	10
54322	SFP.40-1+FOAM	33	54961	SFW.80-VP-3/4-F-350mb	46	58231	T.470-60x2	24	58667	TCDF.35x1.5	10
54331	SFP.40-1+F+a	37	54967	SFW.80-VP-M42x2-F-350mb	46	58251	T.470-1	24	58669	TCDF.1/8	10
54401	SFP.57-1¼	32				58281	T.470-2	24	58671	TCDF.1/4	10
54411	SFP.57-1¼+a	36	56151	SFN.30-1/4	28	58284	TN.10x1.5	6	58673	TCDF.3/8	10
54421	SFP.57-1¼+FIL	33	56156	SFN.30-1/4+F	29	58285	TN.12x1.5	6	58675	TCDF.1/2	10
54422	SFP.57-1¼+FOAM	33	56161	SFN.30-3/8+F	29	58286	TN.14x1.5	6	58677	TCDF.3/4	10
54431	SFP.57-1¼+F+a	37	56171	SFN.30-1/2+F	29	58287	TN.16x1.5	6	58679	TCDF.1	10
54501	SFP.57-1½	32	56181	SFN.40-3/8	28	58288	TN.18x1.5	6	58681	TCDF.26x1.5	10
54511	SFP.57-1½+a	36	56191	SFN.40-3/8+F	29	58289	TN.20x1.5	6	58683	TCDF.40x1.5	10
54521	SFP.57-1½+FIL	33	56201	SFN.40-1/2	28	58290	TN.22x1.5	6	58685	TCDF.1¼	10
54522	SFP.57-1½+FOAM	33	56211	SFN.40-1/2+F	29	58291	TN.25x1.5	6	58687	TCDF.1½	10
54531	SFP.57-1½+F+a	37	56221	SFN.40-3/4+F	29	58292	TN.26x1.5	6			
54611	SVF.16x1.5-10mb	41	56231	SFN.40-1+F	29	58293	TN.35x1.5	6	59501	TCD.10x1.5+a	12
54616	SVF.16x1.5-100mb	41	56241	SFN.57-3/4	28	58294	TN.1/8	6	59503	TCD.12x1.5+a	12
54621	SVF.18x1.5-10mb	41	56251	SFN.57-3/4+F	29	58295	TN.1/4	6	59505	TCD.14x1.5+a	12
54626	SVF.18x1.5-100mb	41	56261	SFN.57-1	28	58296	TN.3/8	6	59507	TCD.16x1.5+a	12
54631	SVF.20x1.5-10mb	41	56271	SFN.57-1+F	29	58296-EX	TN.3/8-EX	7	59509	TCD.18x1.5+a	12
54636	SVF.20x1.5-100mb	41	56281	SFN.57-1¼+F	29	58297	TN.1/2	6	59511	TCD.20x1.5+a	12
54641	SVF.22x1.5-10mb	41	56291	SFN.57-1½+F	29	58297-EX	TN.1/2-EX	7	59513	TCD.22x1.5+a	12
54646	SVF.22x1.5-100mb	41	56381	SFN.70-2	28	58298	TN.3/4	6	59515	TCD.25x1.5+a	12
54651	SVF.1/4-10mb	41	56391	SFN.70-2+F	29	58298-EX	TN.3/4-EX	7	59517	TCD.26x1.5+a	12
54656	SVF.1/4-100mb	41	56651	SFP.40-3/8	32	58299	TN.1	6	59519	TCD.35x1.5+a	12
54661	SVF.3/8-10mb	41	56661	SFP.40-3/8+FIL	33	58401	TN.40x1.5	6	59523	TCD.40x1.5+a	12
54666	SVF.3/8-100mb	41	56671	SFP.40-1/2	32	58411	TN.1¼	6	59531	TCD.1/8+a	12
54671	SVF.1/2-10mb	41	56681	SFP.40-1/2+FIL	33	58413	TN.1½	6	59533	TCD.1/4+a	12
54676	SVF.1/2-100mb	41	56682	SFP.40-1/2+FOAM	33	58551	TCD.10x1.5	10	59535	TCD.3/8+a	12
54681	SVF.3/4-10mb	41	56701	SFP.57-3/4	32	58553	TCD.12x1.5	10	59537	TCD.1/2+a	12
54686	SVF.3/4-100mb	41	56711	SFP.57-3/4+FIL	33	58555	TCD.14x1.5	10	59539	TCD.3/4+a	12
54691	SVF.1-10mb	41	56712	SFP.57-3/4+FOAM	33	58557	TCD.16x1.5	10	59541	TCD.1+a	12
54696	SVF.1-100mb	41	56731	SFP.57-1	32	58559	TCD.18x1.5	10	59543	TCD.1¼+a	12
54701	SFN.70-3/4+F	29	56741	SFP.57-1+FIL	33	58561	TCD.20x1.5	10	59545	TCD.1½+a	12

CODE	DESCRIPTION	PAGE	CODE	DESCRIPTION	PAGE	CODE	DESCRIPTION	PAGE	CODE	DESCRIPTION	PAGE
59557	TCDF.16x1.5+a	12	59881	TPC.26	21	111101	HCY.76-E-NO-M10	107	157171	T.440-1½	23
59559	TCDF.18x1.5+a	12	59885	TPC.26+a	21	111102	HCY.76-E-NC-M10	107	157211	T.440-1/4+a	23
59561	TCDF.20x1.5+a	12	59901	TPCF.20	21	111111	HCY.127-E-NO-M12	107	157221	T.440-3/8+a	23
59563	TCDF.22x1.5+a	12	59905	TPCF.20+a	21	111112	HCY.127-E-NC-M12	107	157231	T.440-1/2+a	23
59565	TCDF.25x1.5+a	12	59921	TPCF.26	21	111121	HCY.254-E-NO-M12	107	157241	T.440-3/4+a	23
59567	TCDF.26x1.5+a	12	59925	TPCF.26+a	21	111122	HCY.254-E-NC-M12	107	157251	T.440-1+a	23
59569	TCDF.35x1.5+a	12	59942	TSD.10x1.5	13	111151	HCY.76-E-ST-NO-M12	109	157261	T.440-1/4+a	23
59573	TCDF.40x1.5+a	12	59944	TSD.12x1.5	13	111152	HCY.76-E-ST-NC-M12	109	157271	T.440-1/2+a	23
59585	TCDF.3/8+a	12	59946	TSD.14x1.5	13	111161	HCY.127-E-ST-NO-M12	109	158295	TNR.1/4	8
59587	TCDF.1/2+a	12	59948	TSD.16x1.5	13	111162	HCY.127-E-ST-NC-M12	109	158296	TNR.3/8	8
59589	TCDF.3/4+a	12	59950	TSD.18x1.5	13	111171	HCY.254-E-ST-NO-M12	109	158297	TNR.1/2	8
59591	TCDF.1+a	12	59952	TSD.20x1.5	13	111172	HCY.254-E-ST-NC-M12	109	158298	TNR.3/4	8
59595	TCDF.1¼+a	12	59954	TSD.22x1.5	13	111211	HCL-300-M12	94	158299	TNR.1	8
59597	TCDF.1½+a	12	59956	TSD.25x1.5	13	111221	HCL-400-M12	94	158411	TNR. 1¼	8
59701	TMB.M14x1,5	14	59958	TSD.26x1.5	13	111231	HCL-500-M12	94	158413	TNR.1½	8
59703	TMB.M16x1,5	14	59960	TSD.35x1.5	13	111271	HFLT-ER-3/4	113			
59705	TMB.M20x1,5	14	59964	TSD.40x1.5	13	111273	HFLT-ER-1	113	161033	TCE.1/4	16
59707	TMB.M26x1,5	14	59972	TSD.1/8	13	111276	HFLT-EF-3/4	113	161034	TCE.3/8	16
59709	TMB.M27x1,5	14	59974	TSD.1/4	13	111278	HFLT-EF-1	113	161035	TCE.1/2	16
59711	TMB.M33x1,5	14	59976	TSD.3/8	13	111281	HFL-EF-NO	111	161036	TCE.3/4	16
59713	TMB.M40x1,5	14	59978	TSD.1/2	13	111283	HFL-EF-NC	111			
59715	TMB.M42x1,5	14	59980	TSD.3/4	13	111286	HFL-ER-NO	111	913691	HFTX.3/4-16 SAE	72
59717	TMB.M42x2	14	59982	TSD.1	13	111288	HFL-ER-NC	111	913731	HFTX.1 1/16-12 SAE	72
59721	TMB.1/4	14	59986	TSD.1¼	13	111351	HCX.127-VT-M12	85	914461	HGFT.13-1/2 NPT	60
59723	TMB.3/8	14	59988	TSD.1½	13	111361	HCX.127/T-VT-M12	85	914462	HGFT.13/PR-1/2 NPT	68
59725	TMB.1/2	14				111371	HCX.254-VT-M12	85	914481	HGFT.16-3/4 NPT	60
59727	TMB.3/4	14	61011	TVD.70-1¼-FKM	25	111381	HCX.254/T-VT-M12	85	914482	HGFT.16/PR-3/4 NPT	68
59729	TMB.1	14	61021	TVD.70-1¼-EPDM	25	111382	HCZ.76-VT-M12	81	914521	HGFT.21-1 NPT	60
59731	TMB.1¼	14				111383	HCZ.76/T-VT-M12	81	914522	HGFT.21/PR-1 NPT	68
59733	TMB.1½	14	110081	SLCK-NO	93	111385	HCZ.127-VT-M12	81			
59751	TMB-HT.M14x1,5	14	110083	SLCK-NC	93	111386	HCZ.127/T-VT-M12	81	953938	SFP.30-1/4 NPT+F	31
59753	TMB-HT.M16x1,5	14	110085	SLCK-NO-NC	93	111388	HCZ.254-VT-M12	81	954222	SFP.40-3/4 NPT+F	31
59755	TMB-HT.M20x1,5	14	110087	SLCK-NC-NC	93	111389	HCZ.254/T-VT-M12	81	954661	SFV.3/8 NPT-10mb	40
59757	TMB-HT.M26x1,5	14	110089	SLCK-NO-NO	93	111392	HCZ.76-P-VT-M12	81	954666	SFV.3/8 NPT-100mb	40
59759	TMB-HT.M27x1,5	14	111001	HCK.76-M10	90	111393	HCZ.76/T-P-VT-M12	81	954671	SFV.1/2 NPT-10mb	40
59761	TMB-HT.M33x1,5	14	111004	HCK.76-GL-M10	91	111395	HCZ.127-P-VT-M12	81	954676	SFV.1/2 NPT-100mb	40
59763	TMB-HT.M40x1,5	14	111005	HCK.76-GL-SST-M10	91	111396	HCZ.127/T-P-VT-M12	81	954701	SFN.70-3/4 NPT+F	30
59765	TMB-HT.M42x1,5	14	111011	HCK.127-M12	90	111398	HCZ.254-P-VT-M12	81	954851	SFP.70-3/4 NPT+F	31
59767	TMB-HT.M42x2	14	111014	HCK.127-GL-M12	91	111399	HCZ.254/T-P-VT-M12	81	954911	SFW.70-3/4 NPT+F-350mb	42
59771	TMB-HT.1/4	14	111015	HCK.127-GL-SST-M12	91				956156	SFN.30-1/4 NPT+F	30
59773	TMB-HT.3/8	14	111021	HCK.176-M12	90	156833	SMN.46-1/4-F40	50	956181	SFN.40-1/4 NPT+F	30
59775	TMB-HT.1/2	14	111024	HCK.176-GL-M12	91	156836	SMN.46-BA-F40	52	956191	SFN.40-3/8 NPT+F	30
59777	TMB-HT.3/4	14	111025	HCK.176-GL-SST-M12	91	156883	SMN.80-3/4-F40	50	956211	SFN.40-1/2 NPT+F	30
59779	TMB-HT.1	14	111031	HCK.254-M12	90	156886	SMN.80-BA-F40	52	956221	SFN.40-3/4 NPT+F	30
59781	TMB-HT.1¼	14	111034	HCK.254-GL-M12	91	156983	SMW.80-3/4-F40-350mb	50	956251	SFN.57-3/4 NPT+F	30
59783	TMB-HT.1½	14	111035	HCK.254-GL-SST-M12	91	156986	SMW.80-BA-F40-350mb	52	956652	SFP.40-1/4 NPT+F	31
59791	TMA.1/4	14	111041	HCK.381-M12	90	157111	T.440-1/4	23	956662	SFP.40-3/8 NPT+F	31
59801	TMA.3/8	14	111044	HCK.381-GL-M12	91	157121	T.440-3/8	23	956682	SFP.40-1/2 NPT+F	31
59811	TMA.1/2	14	111045	HCK.381-GL-SST-M12	91	157131	T.440-1/2	23	956712	SFP.57-3/4 NPT+F	31
59821	TMA.3/4	14	111051	HCK.508-M12	90	157141	T.440-3/4	23	956833	SMN.46-1/4 NPT-F40	48
59861	TPC.20	21	111054	HCK.508-GL-M12	91	157151	T.440-1	23	956883	SMN.80-3/4 NPT-F40	48
59865	TPC.20+a	21	111055	HCK.508-GL-SST-M12	91	157161	T.440-1¼	23	956983	SMW.80-3/4 NPT-F40-350mb	48

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958296	TN.3/8 NPT	6	GN.22425	GN 441-32-G3/4-1-BL	20	GN.37457	GN 743.3-24-M33x1.5-B	62	GN.37565	GN 743-18-G3/4-A	60
958297	TN.1/2 NPT	6	GN.22427	GN 441-32-G3/4-1-SW	20	GN.37458	GN 743.3-24-G1-A	62	GN.37567	GN 743-24-G1-A	60
958298	TN.3/4 NPT	6	GN.22435	GN 441-40-G1-1-BL	20	GN.37459	GN 743.3-24-G1-B	62	GN.37569	GN 743-32-G1¼-A	60
958601	TCD.1/4 NPT	9	GN.22437	GN 441-40-G1-1-SW	20	GN.37462	GN 743.5-11-M16x1.5-B	63	GN.37571	GN 743-32-G1¼-A	60
958611	TCD.3/8 NPT	9	GN.22451	GN 442-22-M16x1.5-1-BL	20	GN.37464	GN 743.5-11-G3/8-B	63	GN.37573	GN 743-32-G1¼-B	60
958621	TCD.1/2 NPT	9	GN.22453	GN 442-22-M16x1.5-1-SW	20	GN.37466	GN 743.5-14-M20x1.5-B	63	GN.37601	GN 743-11-M16x1.5-B	60
958631	TCD.3/4 NPT	9	GN.22455	GN 442-22-G3/8-1-BL	20	GN.37468	GN 743.5-14-G1/2-B	63	GN.37611	GN 743-14-M20x1.5-B	60
958671	TCDF.1/4 NPT	9	GN.22457	GN 442-22-G3/8-1-SW	20	GN.37470	GN 743.5-18-M26x1.5-B	63	GN.37621	GN 743-18-M26x1.5-B	60
958673	TCDF.3/8 NPT	9	GN.22461	GN 442-26-M20x1.5-1-BL	20	GN.37472	GN 743.5-18-G3/4-B	63	GN.37623	GN 743-18-M27x1.5-B	60
958675	TCDF.1/2 NPT	9	GN.22463	GN 442-26-M20x1.5-1-SW	20	GN.37474	GN 743.5-24-M33x1.5-B	63	GN.37631	GN 743-24-M33x1.5-B	60
958677	TCDF.3/4 NPT	9	GN.22465	GN 442-26-G1/2-1-BL	20	GN.37476	GN 743.5-24-G1-B	63	GN.37641	GN 743-32-M40x1.5-B	60
959974	TS.1/4 NPT	13	GN.22467	GN 442-26-G1/2-1-SW	20	GN.37478	GN 743.5-32-M42x1.5-B	63	GN.37643	GN 743-32-M42x1.5-B	60
959976	TS.3/8 NPT	13	GN.22471	GN 442-32-M26x1.5-1-BL	20	GN.37479	GN 743.5-32-G1º-B	63	GN.37661	GN 743-11-G3/8-B	60
959978	TS.1/2 NPT	13	GN.22473	GN 442-32-M26x1.5-1-SW	20	GN.37481	GN 743.7-11-R3/8-A	65	GN.37663	GN 743-14-G1/2-B	60
959980	TS.3/4 NPT	13	GN.22475	GN 442-32-G3/4-1-BL	20	GN.37482	GN 743.7-11-R3/8-B	65	GN.37665	GN 743-18-G3/4-B	60
			GN.22477	GN 442-32-G3/4-1-SW	20	GN.37483	GN 743.7-14-R1/2-A	65	GN.37667	GN 743-24-G1-B	60
961034	TCE.3/8 NPT	16	GN.22485	GN 442-40-G1-1-BL	20	GN.37484	GN 743.7-14-R1/2-B	65	GN.37669	GN 743-32-G1¼-B	60
961035	TCE.1/2 NPT	16	GN.22487	GN 442-40-G1-1-SW	20	GN.37485	GN 743.7-18-R3/4-A	65	GN.37701	GN 743.1-11-M16x1.5-A	61
961036	TCE.3/4 NPT	16				GN.37486	GN 743.7-18-R3/4-B	65	GN.37703	GN 743.1-14-M20x1.5-A	61
			GN.37421	GN 743.2-11-M16x1.5-A	62	GN.37487	GN 743.7-24-R1-A	65	GN.37705	GN 743.1-18-M26x1.5-A	61
111001-NP	HCK.76-M10-NP	90	GN.37422	GN 743.2-11-M16x1.5-B	62	GN.37488	GN 743.7-24-R1-B	65	GN.37707	GN 743.1-18-M27x1.5-A	61
111011-NP	HCK.127-M12-NP	90	GN.37423	GN 743.2-11-G3/8-A	62	GN.37489	GN 743.7-32-R1¼-A	65	GN.37709	GN 743.1-24-M33x1.5-A	61
111021-NP	HCK.176-M12-NP	90	GN.37424	GN 743.2-11-G3/8-B	62	GN.37490	GN 743.7-32-R1¼-B	65	GN.37711	GN 743.1-32-M40x1.5-A	61
111031-NP	HCK.254-M12-NP	90	GN.37425	GN 743.2-14-M20x1.5-A	62	GN.37491	GN 743.8-11-R3/8-A	67	GN.37713	GN 743.1-32-M42x1.5-A	61
111041-NP	HCK.381-M12-NP	90	GN.37426	GN 743.2-14-M20x1.5-B	62	GN.37492	GN 743.8-11-R3/8-B	67	GN.37715	GN 743.1-11-G3/8-A	61
111051-NP	HCK.508-M12-NP	90	GN.37427	GN 743.2-14-G1/2-A	62	GN.37493	GN 743.8-14-R1/2-A	67	GN.37717	GN 743.1-14-G1/2-A	61
			GN.37428	GN 743.2-14-G1/2-B	62	GN.37494	GN 743.8-14-R1/2-B	67	GN.37719	GN 743.1-18-G3/4-A	61
953938-L*	SFP.30-1/4 NPT+F+a-L*	34	GN.37430	GN 743.2-18-M26x1.5-A	62	GN.37495	GN 743.8-18-R3/4-A	67	GN.37721	GN 743.1-24-G1-A	61
954222-L*	SFP.40-3/4 NPT+F+a-L*	34	GN.37431	GN 743.2-18-M27x1.5-A	62	GN.37496	GN 743.8-18-R3/4-B	67	GN.37723	GN 743.1-32-G1¼-A	61
954851-L*	SFP.70-3/4 NPT+F+a-L*	34	GN.37432	GN 743.2-18-M26x1.5-B	62	GN.37497	GN 743.8-24-R1-A	67	GN.37725	GN 743.1-32-G1¼-A	61
956652-L*	SFP.40-1/4 NPT+F+a-L*	34	GN.37433	GN 743.2-18-M27x1.5-B	62	GN.37498	GN 743.8-24-R1-B	67	GN.37727	GN 743.1-32-G1¼-B	61
956662-L*	SFP.40-3/8 NPT+F+a-L*	34	GN.37434	GN 743.2-18-G3/4-A	62	GN.37499	GN 743.8-32-R1¼-A	67	GN.37731	GN 743.1-11-M16x1.5-B	61
956682-L*	SFP.40-1/2 NPT+F+a-L*	34	GN.37435	GN 743.2-18-G3/4-B	62	GN.37500	GN 743.8-32-R1¼-B	67	GN.37733	GN 743.1-14-M20x1.5-B	61
956712-L*	SFP.57-3/4 NPT+F+a-L*	34	GN.37436	GN 743.2-24-M33x1.5-A	62	GN.37501	GN 743-11-M16x1.5-A	60	GN.37735	GN 743.1-18-M26x1.5-B	61
958601-L*	TCD.1/4 NPT+a-L*	11	GN.37437	GN 743.2-24-M33x1.5-B	62	GN.37511	GN 743-14-M20x1.5-A	60	GN.37737	GN 743.1-18-M27x1.5-B	61
958611-L*	TCD.3/8 NPT+a-L*	11	GN.37438	GN 743.2-24-G1-A	62	GN.37521	GN 743-18-M26x1.5-A	60	GN.37739	GN 743.1-24-M33x1.5-B	61
958621-L*	TCD.1/2 NPT+a-L*	11	GN.37439	GN 743.2-24-G1-B	62	GN.37523	GN 743-18-M27x1.5-A	60	GN.37741	GN 743.1-32-M40x1.5-B	61
958631-L*	TCD.3/4 NPT+a-L*	11	GN.37441	GN 743.3-11-M16x1.5-A	62	GN.37531	GN 743-24-M33x1.5-A	60	GN.37743	GN 743.1-32-M42x1.5-B	61
958673-L*	TCDF.3/8 NPT+a-L*	11	GN.37442	GN 743.3-11-M16x1.5-B	62	GN.37541	GN 743-32-M40x1.5-A	60	GN.37745	GN 743.1-11-G3/8-B	61
958675-L*	TCDF.1/2 NPT+a-L*	11	GN.37443	GN 743.3-11-G3/8-A	62	GN.37543	GN 743-32-M42x1.5-A	60	GN.37747	GN 743.1-14-G1/2-B	61
958677-L*	TCDF.3/4 NPT+a-L*	11	GN.37444	GN 743.3-11-G3/8-B	62	GN.37547	GN 743.4-11-G3/8-B	61	GN.37749	GN 743.1-18-G3/4-B	61
			GN.37445	GN 743.3-14-M20x1.5-A	62	GN.37548	GN 743.4-11-M16x1.5-B	61	GN.37751	GN 743.1-24-G1-B	61
GN.22401	GN 441-22-M16x1.5-1-BL	20	GN.37446	GN 743.3-14-M20x1.5-B	62	GN.37549	GN 743.4-14-G1/2-B	61	GN.37753	GN 743.1-32-G1¼-B	61
GN.22403	GN 441-22-M16x1.5-1-SW	20	GN.37447	GN 743.3-14-G1/2-A	62	GN.37550	GN 743.4-14-M20x1.5-B	61	GN.37761	GN 743.6-11-G3/8	63
GN.22405	GN 441-22-G3/8-1-BL	20	GN.37448	GN 743.3-14-G1/2-B	62	GN.37551	GN 743.4-18-G3/4-B	61	GN.37762	GN 743.6-11-M16x1.5	63
GN.22407	GN 441-22-G3/8-1-SW	20	GN.37450	GN 743.3-18-M26x1.5-A	62	GN.37552	GN 743.4-18-M26x1.5-B	61	GN.37766	GN 743.6-14-G1/2	63
GN.22411	GN 441-26-M20x1.5-1-BL	20	GN.37451	GN 743.3-18-M27x1.5-A	62	GN.37553	GN 743.4-24-G1-B	61	GN.37767	GN 743.6-14-M20x1.5	63
GN.22413	GN 441-26-M20x1.5-1-SW	20	GN.37452	GN 743.3-18-M26x1.5-B	62	GN.37554	GN 743.4-24-M33x1.5-B	61	GN.37771	GN 743.6-18-G3/4	63
GN.22415	GN 441-26-G1/2-1-BL	20	GN.37453	GN 743.3-18-M27x1.5-B	62	GN.37555	GN 743.4-32-G1¼-B	61	GN.37772	GN 743.6-18-M26x1.5	63
GN.22417	GN 441-26-G1/2-1-SW	20	GN.37454	GN 743.3-18-G3/4-A	62	GN.37556	GN 743.4-32-M42x1.5-B	61	GN.37773	GN 743.6-18-M27x1.5	63
GN.22421	GN 441-32-M26x1.5-1-BL	20	GN.37455	GN 743.3-18-G3/4-B	62	GN.37561	GN 743-11-G3/8-A	60	GN.37781	GN 744-14-M20x1.5	69

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GN.37785	GN 744-18-M27x1.5	69	GN.37937	GN 749-G1¼-A	17	GN.90787	DIN 908-ST-G1/4-AA	19			
GN.37787	GN 744-24-M33x1.5	69	GN.37938	GN 749-G1½-A	17	GN.90788	DIN 908-ST-G1/4-AC	19			
GN.37791	GN 744-14-G1/2"	69				GN.90791	DIN 908-ST-G3/8-A	18			
GN.37793	GN 744-18-G3/4"	69	GN.90701	DIN 908-ST-M8x1-A	18	GN.90792	DIN 908-ST-G3/8-AA	19			
GN.37795	GN 744-24-G1"	69	GN.90702	DIN 908-ST-M8x1-AA	19	GN.90793	DIN 908-ST-G3/8-AC	19			
GN.37810	GN 741-19-M14x1.5-OS-1	15	GN.90703	DIN 908-ST-M8x1-AC	19	GN.90796	DIN 908-ST-G1/2-A	18			
GN.37811	GN 741-22-M16x1.5-OS-1	15	GN.90706	DIN 908-ST-M10x1-A	18	GN.90797	DIN 908-ST-G1/2-AA	19			
GN.37813	GN 741-26-M20x1.5-OS-1	15	GN.90707	DIN 908-ST-M10x1-AA	19	GN.90798	DIN 908-ST-G1/2-AC	19			
GN.37816	GN 741-32-M26x1.5-OS-1	15	GN.90708	DIN 908-ST-M10x1-AC	19	GN.90801	DIN 908-ST-G3/4-A	18			
GN.37817	GN 741-40-M33x1.5-OS-1	15	GN.90711	DIN 908-ST-M12x1.5-A	18	GN.90802	DIN 908-ST-G3/4-AA	19			
GN.37818	GN 741-50-M42x2-OS-1	15	GN.90712	DIN 908-ST-M12x1.5-AA	19	GN.90803	DIN 908-ST-G3/4-AC	19			
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GN.37821	GN 741-22-G3/8-OS-1	15	GN.90716	DIN 908-ST-M14x1.5-A	18	GN.90807	DIN 908-ST-G1-AA	19			
GN.37822	GN 741-26-G1/2-OS-1	15	GN.90717	DIN 908-ST-M14x1.5-AA	19	GN.90808	DIN 908-ST-G1-AC	19			
GN.37823	GN 741-32-G3/4-OS-1	15	GN.90718	DIN 908-ST-M14x1.5-AC	19	GN.90811	DIN 908-ST-G1 1/4-A	18			
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GN.37884	GN 742-40-G1-OS-1	15	GN.90742	DIN 908-ST-M24x1.5-AA	19	GN.974377	GN 743.7-24-1 NPT-B	64			
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GN.37886	GN 742-60-G11/2-OS-1	15	GN.90746	DIN 908-ST-M26x1.5-A	18	GN.974379	GN 743.7-32-1¼NPT-B	64			
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GENERAL SALES CONDITIONS

- 1) ELESa reserves the right to amend, at any time, even after stipulation of the contract, the prices agreed upon in the event of considerable increases in the cost of raw materials, of labour or of other major encumbrances of whatsoever nature (fiscal, pertaining to contributions, due to exchange rate variations, etc.).
- 2) ELESa also reserves the right to modify its products for the exclusive purpose of improving these in terms of quality and functionality.
- 3) ELESa does not accept orders for deliveries to be effected after more than six months, excepting in circumstances to be arranged by way of specific written agreement.
- 4) In the case of special manufacturing orders (products specifically made-to-order) ELESa reserves the right to a $\pm 5\%$ tolerance between quantities ordered and delivered.
- 5) ELESa assumes no responsibility for damage that the goods may suffer during transport.
- 6) ELESa reserves the right to accept or refuse any cancellations of standard product orders. In the case of acceptance ELESa may demand a penalty equal to 10% of the order value.
- 7) In the case of special manufacturing orders, the specific sales conditions agreed upon in writing shall apply. In any case, as a general rule, these orders may not be cancelled by the purchaser.
- 8) Goods returned due to errors on the part of ELESa, and acknowledged thereby, will be credited for the full value. In other cases returns must be subject to prior written agreement, and they must be effected carriage free exclusively to the warehouse of origin and will be subject to a reconditioning charge equal to 20% of the value of the goods, with a minimum charge of Euro 25,00. Returns must be authorised in writing by ELESa.
- 9) Payment of the order must be effected within the term agreed and specified in the invoice. The company does not accept requests for discounts or round-offs.
- 10) In the event that the purchaser fails to collect the standard products ordered, after 30 (thirty) days have passed from the date established for consignment ELESa reserves the right to terminate the contract for default of the purchaser and shall hence be free to resell said products to third parties. Furthermore, in such a case, the purchaser must pay ELESa a penalty equal to 20% of the value of the goods for reconditioning. This without prejudice to ELESa's right to compensation of greater damages.
- 11) In the event that the purchaser fails to collect the special goods ordered, after 30 (thirty) days have passed from the date established for consignment ELESa reserves the right to effect direct delivery to the customer's domicile or, in the case of refusal, to deposit the goods, on the behalf and at the expense of the purchaser, at a public deposit.
- 12) It remains implicit that ownership of the goods to which the sale refers will be transferred at the time of final payment of the sales price. Hence, up until that time, the purchaser who has collected the goods but has not yet effected payment, shall be considered consignee and custodian thereof, sustaining all the related charges but without being entitled to any consideration.
- 13) Any complaints shall be null and void unless they are submitted in writing and, in any case, within 8 days from delivery of the goods under penalty of cancellation. In any case, the submission of complaints or objections does not authorise the purchaser to suspend and/or delay and/or reduce the payments agreed upon.
- 14) ELESa declares that all its sales contracts are governed by these general conditions, which are brought to the notice of the customers through the printing thereof on catalogues and on sales documentation. Therefore, these conditions are to be considered fully accepted, excepting in the case of specific agreement to the contrary, to be effected in writing under the penalty of cancellation. ELESa hereby declares that any general conditions of contract printed in the purchaser's purchase orders are to be deemed not accepted and automatically replaced by these conditions.
- 15) For all other conditions, the purchaser should refer to the conditions established by each distributor.
- 16) **GUARANTEE CONDITIONS**
 - a) The items and components described in the Product Catalogues are guaranteed by ELESa S.p.A Monza - Milan - Italy (ELESa) exclusively against manufacturing defects or material flaws, for a period of six (6) months from the date of purchase on the part of constructors or retailers. The guarantee does not apply where the product has been used inappropriately or in a manner other than that intended.
 - b) In the case of enforcement of the aforesaid guarantee, for each product returned (at the purchaser's expense) ELESa shall arrange for repair or replacement or refund as it may deem fit.
 - c) The purchaser is exonerated from the obligation to return the faulty product in the event of both of the following conditions being met: 1. the item or component

has been destroyed as a result of the defect covered by the guarantee; 2. it is reasonable to assume that ELESa was aware of the defect at the time of sale. In this case ELESa shall be obliged to provide for replacement of the item even in the case of failure to effect prior return of the faulty item.

d) ELESa does not in any case assume responsibility for damages that may arise from the flaws covered by the aforesaid guarantee. ELESa's responsibility is in fact limited to the sales price of the faulty item or component.

e) ELESa has done the utmost to illustrate all the products described in the Product Catalogues with accuracy (illustrations, drawings, captions, descriptions). However, ELESa specifies that the descriptive details contained are for informative purposes only and do not bind ELESa to complete conformity between said descriptions and the products.

f) The guarantee referred to hereunder is the only guarantee that ELESa acknowledges to the purchasers of its products. No party is authorised to assume any responsibility on ELESa's behalf in relation to the sale or use of these products.

INFORMATION PURSUANT TO LEGISLATIVE DECREE NO. 196/2003 ON THE PROTECTION OF PERSONAL DATA

17) a - "Pursuant to Legislative Decree no. 196/2003 we inform you that your data will be processed by us in a lawful and proper manner, for the exclusive purpose of executing the economic activity performed by our company. We also inform you that the Data Controller is the undersigned Company and that you can assert the rights sanctioned by the aforesaid law".

b - ELESa specifies that these data could have been sent automatically to the names on its customer list or following explicit request or registration on its website or previous contact. In accordance with the provisions of the aforementioned privacy code, you are hereby notified that you may request not to receive further sales information from ELESa by writing to the e-mail address info@elesa.com or by sending a fax to the number +39 039-836351.

DECLARATION OF CONFORMITY

18) ELESa certifies that all the products which it markets, in accordance with the contractual specifications, conditions and requirements set forth in the order confirmation, comply with the specifications set forth in the catalogues in force or in the diagrams relating thereto.

19) The Quality System of the company ELESa S.p.A. Monza - Milan, has been certified ISO 9001 (Certif. No. FM23747) since 1993 and ISO 14001 since 2007 by BSI.

20) The information contained in the Product Catalogues supersedes and cancels information contained in the previous versions of the catalogues or of the other advertising and/or promotional material of ELESa.

21) All the measurements in the tables contained in the Product Catalogues are provided in mm, unless otherwise specified, and rounded off to the nearest unit. The assembly tolerance allocations are specified, where provided, in the dimensional table for each product. If further product data is required, the ELESa Sales Service should be contacted. The weights specified in the tables, expressed in grams, are approximate and are not binding.

22) As ELESa carries out systematic research and development activities for continuous product quality improvement, it reserves the right to modify at any time, and without prior notice, the dimensions, the manufacturing and the technical specifications of existing products. For this reason ELESa invites potential purchasers to compare the sales information available in the printed catalogues in circulation with that found in the interactive catalogues on the ELESa websites (www.elesa.com - www.elesa.co.uk - www.elesa.se) which tend to be more up-to-date, and to which reference should be made in the event of doubt. In the case of constructive modifications already announced in the printed catalogues or in the interactive catalogue published on the ELESa website, it may be some time before products containing said modifications become available. This also to allow for consumption of stocks of products manufactured prior to said modifications existing in the various manufacturing stages.

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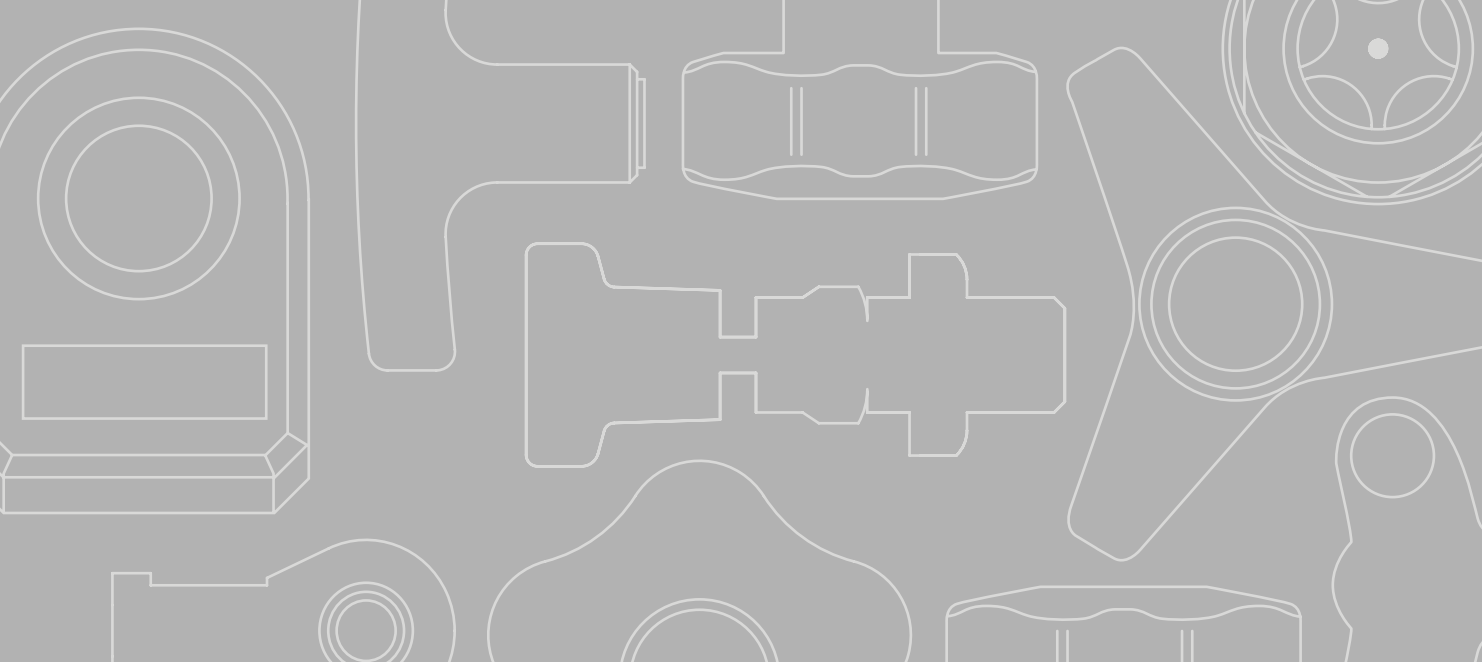
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