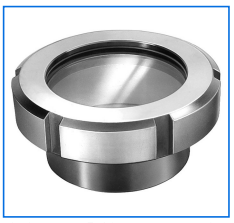
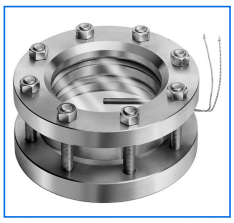
PROCESS OBSERVATION

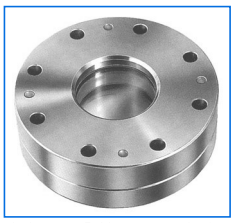
Sightglasses


PN 0 or similar to DIN 28120 (PN 2,5)

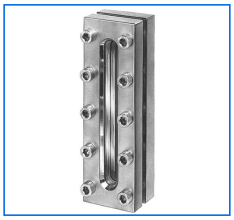

to or similar to DIN 28120 / 28121


similar to DIN 11851, series SSA

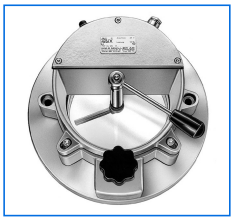

similar to DIN 28120, double glazed, with or without heating


similar to DIN 28121, double glazed, with or without heating

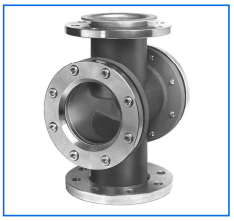

D-ended, elongated, series LSG (R, RR)

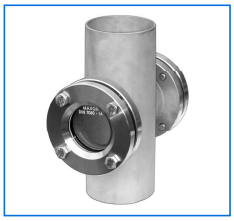

Rectangular, series RSG (R, RR)

Hinged sightglasses


with or without illumination, series KSG(B)

Sightflow indicators


with flanged ends for bolting, series FF-VA, FB-VA, F-St


with ends for welding, series S-VA, S-St


with flanged ends for bolting, series FDG, FDS, FDE

Accessories for sightglasses


Centrally operated wipers, series W(D), WDT, W(D)R, up to PN 6

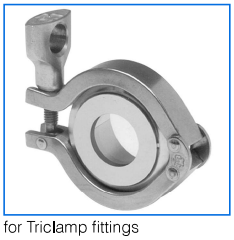

Sideways operated wipers, series WS, up to PN 16


Spraying devices, series SV


Spraying devices, series SVS


Sightglass discs with or without central bore hole

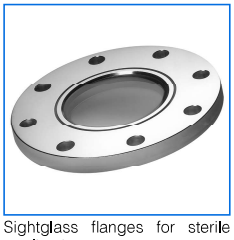
Metal fused sightglasses


for Triclamp fittings


with wiper series WD for Triclamp fittings


for NA-Connect-connections

METACLAMP® sigthglasses for NA-Connect-connections


Sightglass flanges for sterile applications

Camera systems for hazardous areas


Series miniZoom

Circular sightglasses for welding into or onto vessel walls, in version PN 0 / PN 2,5 with a viewing diameter equal to DIN 28120

Circular sightglass, DN 150, PN 0, with glass disc in sodium silicate to DIN 8902 and wiper of the series W, wiper blade in silicone

Circular sightglass similar to DIN 28120, DN 150, PN 2,5, with glass disc in sodium silicate to DIN 8902

Application:
The circular sightglass fittings are used for the observation and illumination of the inside of unpressurised vessels, silos, tanks etc. or such of a nominal pressure (PN) of 2,5 bar.
They represent, especially for large nominal diameters, a **cost-saving alternative** to the sightglasses of the pressure rates 6, 10 and 16 bar.

Viewing diameter:
80 - 225 mm

Operating conditions:

Pressure:	No pressure (PN 0) resp. PN 2,5
Temperatures:	Max. 150 °C with glass disc in sodium silicate to DIN 8902 Max. 280 °C with glass disc in borosilicate to DIN 7080

Materials:

Base flange:	1.4571 (AISI 316 Ti) (standard PN 0) / 1.4404 (AISI 316 L) (standard PN 2,5) 1.4541 (AISI 321), RSt 37-2, H II or other materials on demand
Cover flange:	1.4301 (AISI 304) (standard PN 0) / 1.4541 (AISI 321) (standard PN 2,5) 1.4404 (AISI 316 L), 1.4571 (AISI 316 Ti), RSt 37-2, H II or other materials on demand
Sightglass disc:	Sodium silicate glass to DIN 8902 (standard) Borosilicate glass to DIN 7080 on demand
Gaskets:	KLINGERsil C4400, PTFE, Perbunan, Silicon, Viton, Gylon or other materials on demand
Screws / studs and nuts:	A2-70 (standard) A4-70 or 5.6 zinked on demand

Possible combinations:
The sightglasses can be combined with our centrally operated window wipers of the series W / WD / WDT, with the spraying devices of the series SVS (only version for PN 2,5) as well as with our sightglass light fittings of the series CHEMLUX®, EdelLUX®, miniLUX® or fibroLUX® for use in hazardous or safe areas. In these cases, the cover flanges are drilled and tapped to suit the respective light fitting fixation.

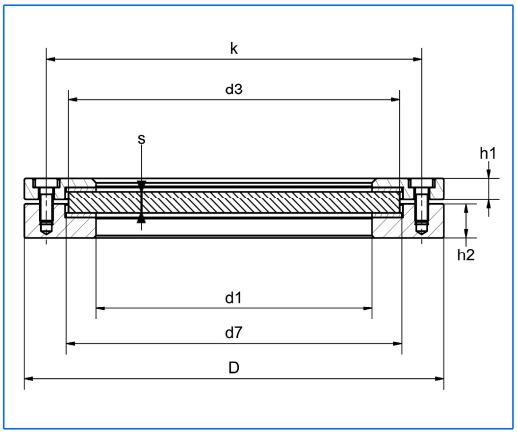
Special versions:
- Special high vacuum-tight version with additional O-ring seal
- Glass disc in quartz and special gaskets for very high operating temperatures

Contents of delivery:
The complete delivery consists of base and cover flanges, glass disc, gaskets for product and cover side and hexagonal socket head screws (version for PN 0) resp. studs and nuts (version for PN 2,5).

Certificates:
On request against extra charge, to DIN 50049, 3.1(B), alternatively 3.1A for the flanges, 2.2 or 3.1 for the glass discs.

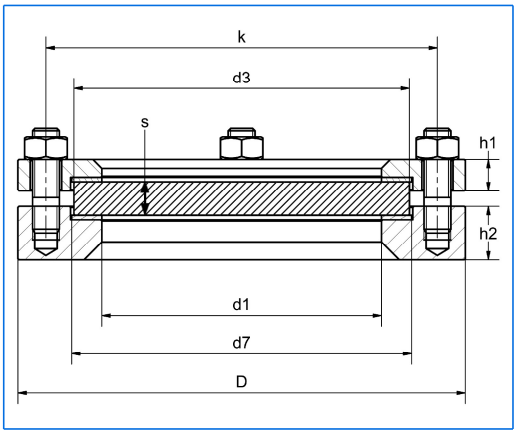
Dimensions
Mounting

Unpressurised version (PN 0)



Nominal flange diameter (DN)	d1	d3	s	d7	D	k	h1	h2	Socket head screws
50	80	100	10	102	140	120	10	15	4 x M6
80	100	125	10	127	165	145	10	15	8 x M6
100	125	150	10	152	190	170	10	15	8 x M6
125	150	175	10	177	215	195	10	15	8 x M6
150	175	200	10	202	240	220	10	15	8 x M6
200	225	250	10	252	290	270	10	15	8 x M6

Version for PN 2,5



Nominal flange diameter (DN)	d1	d3	s	d7	D	k	h1	h2	Studs
50	80	100	10	102	150	125	12	24	4 x M12
80	100	125	15	127	175	150	14	24	4 x M12
100	125	150	15	152	200	175	14	24	4 x M12
125	150	175	15	177	220	195	16	24	8 x M12
150	175	200	15	202	250	220	16	24	8 x M12
200	225	250	15	252	300	275	16	24	8 x M12

Mounting:
After having correctly welded the base flange onto or into the vessel wall, the product side gasket, the glass disc, the cover side gasket and the cover flange are mounted one after the other and then the socket head screws tightened against the cover flange (version for PN 0) resp. the nuts against the studs (version for PN 2,5).

Attention: The base flange has to be welded into or onto the vessel wall without any distortion to ensure a plain and flat sealing surface to avoid the breakage of the glass disc. If necessary, rework the sealing surface after welding. The screws have to be tightened evenly and crosswise.

Branch office / exclusive agent:

Do you wish for more information about our wide range of light fittings for use in hazardous and safe areas, camera systems for hazardous areas, about our range of circular sightglasses to DIN 28120/28121, screwed sightglasses similar to DIN 11851, rectangular or D-ended sightglasses, sightglasses and light fittings for sterile applications STERI-LINE, pipeline flow indicators, centrally or sideways operated wipers, hinged sightglasses, spraying devices or our complete sight and lightglass units VETROLUX®? Are you interested in other types, special versions or different protection degrees? If yes, please contact us, our branch office or our local agents – it is our business! You will find the necessary indications about our sales network on the Internet.

All dimensions in mm. Subject to changes without preliminary notice.

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02.11

Circular sightglass fittings to DIN 28120 or similar
Circular sightglass fittings to DIN 28121
Illuminated sightglass units VETROLUX®

Complete assembly of sightglass fitting to DIN 28120, DN 100, PN 10, with glass disc of borosilicate to DIN 7080.

Complete assembly of sightglass fitting to DIN 28120, DN 125, PN 10, with glass disc of toughened sodium silicate to DIN 8902, fitted with CHEMLUX® sightglass light fitting, type L 20 deH Sch, tilting hinge fixation

In addition to the well known programme of sightglass light fittings, MAX MÜLLER AG supplies complete sightglass fittings to or similar to DIN 28120 and to DIN 28121. These form, together with the reliable light fittings of the series CHEMLUX®, EdelLUX®, fibroLUX®, miniLUX® or metaLUX®, complete illuminated sightglass units VETROLUX® where both components are thoroughly determined and correctly chosen. The units are supplied as premounted sets, offering the following advantages:

- **Only one supplier**
- **Responsibility from one hand**
- **Components mutually adapted, avoiding therefore mounting problems or eventual expensive adjustments.**

With MAX MÜLLER AG, you have chosen the right and efficient partner, offering excellent service and high quality to very interesting prices. Ask the experts of MAX MÜLLER AG for advice and integrate VETROLUX® units into your installations. Remember: Our product range has a background of more than 40 year's experience and development. Both you and your customers will benefit from this know-how.

Application:
In all cases where chemical or physical processes, reactions or e.g. fluid levels have to be observed, controlled or read off at the interior of stirred tanks, dryers, columns, silos, centrifuges, mixers, reactors, evaporators, separators, pipelines, pressure vessels or other closed containers.

Nominal diameters:

PN 10, 16:	DN 50 - 200 (DIN 28120)
PN 6:	DN 50 - 200 (similar to DIN 28120)
PN 10, 25:	DN 40 - 200 (DIN 28121)

Operating conditions:

Max. pressure:	DIN 28120:	10, 16, (6)	bar
	DIN 28121:	10, 25	bar
	Higher pressures on demand		
Vacuum			

Possible combinations:
Sightglass fittings to DIN 28120 or to DIN 28121 **may be combined with our sightglass light fittings of the series CHEMLUX®, EdelLUX®, fibroLUX®, miniLUX® or metaLUX® for use in hazardous or in safe areas.** The cover flanges are drilled and tapped to be fitted with the respective light fitting in case of ordering the complete VETROLUX® unit.
Sightglass fittings to DIN 28120 or similar **may further be equipped with window wipers of the series W, WD or WS** (attention to the pressure limits!) **as well as with spraying devices of the series SV / SVS** for the occasional or continuous cleaning of the sightglass disc. (See separate leaflets).

Certificates:
To be supplied against extra charge to DIN EN 10204.

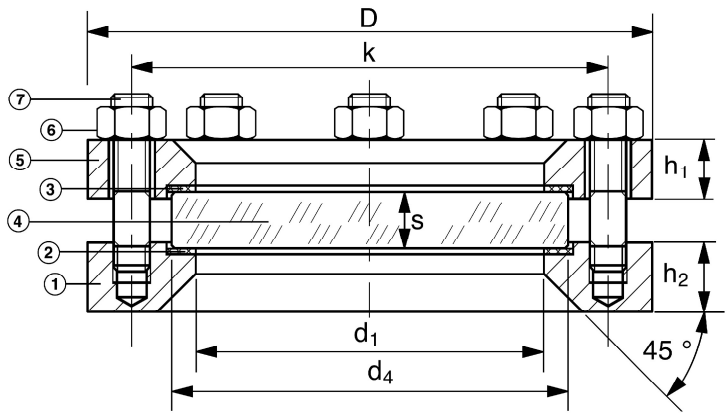
MAX MÜLLER AG
Your reliable and efficient partner in sightglasses.
Perfect, thoroughly engineered solutions from one hand!
Always an interesting, technically advanced idea ahead!

Circular sightglass fittings to DIN 28120 (PN 10, 16)
Circular sightglass fittings similar to DIN 28120 (PN 6)

Dimensions
Assembly and construction materials
Mounting

Our circular sightglass fittings to be welded into or onto vessel walls correspond in their construction and assembly to the dimensions and constructional guidelines of the DIN specification 28120. The respect of the DIN prescriptions for the flange thicknesses guarantees a distortion free location of the sightglass disc. The pressure resistance of the sightglass disc is, of course, dependent on the care with which the bolts and nuts are tightenend (always working on diametrically opposed pairs). For lubricated bolts, μ = 0.1, the recommended tightening torque values (in Nm) are indicated in the table below. The maximum operating temperature is limited to 150 °C when using sighglass discs of sodium silicate to DIN 8902 and to 280 °C when using sightglass discs of borosilicate to DIN 7080. This temperature is also function of the quality of the used gaskets. For operating temperatures lower than –10 °C, please consult the descriptive sheet AD 2000 W 10.

Nominal diameter (DN)	Nominal pressure (PN) (bar)	Viewing diameter d_1	Glass disc		Base flange and cover flange				Bolts or studs and nuts		
			d_4	s	D	k	h_1	h_2	Number	Size	Tightening torque (Nm)
50	6	80	100	10	165	125	16	30	4	M 16	
	10			15							28
	16			15							32
80	6	100	125	15	200	160	20	30	8	M 16	
	10			15							20
	16			20							23
100	6	125	150	15	220	180	18	30	8	M 16	
	10			20			22				26
	16			25			22				30
125	6	150	175	20	250	210	18	30	8	M 16	
	10			20			25				32
	16			25			25				34
150	6	175	200	20	285	240	18	36	8	M 20	
	10			25			30				47
	16			30			30				54
200	6	225	250	25	340	295	20	36	8	M 20	
	10			30			35				63



A special high vacuum-tight version with additional O-ring seal in different materials may be delivered on demand.

Assembly and construction materials:

		Standard	On demand*
① ⑤	**Base flange** **Cover flange**	Steel RSt 37-2 1.4571 (= AISI 316 Ti) or 1.4541 (= AISI 321)	1.4404 (= AISI 316 L) Aluminium Titan Inconel Steel zinked
② ③	**Gaskets**	KLINGERsil C 4400	PTFE Silicone Viton Gylon
④	**Glass disc**	Sodium silicate to DIN 8902 (max. 150 °C)	Borosilicate to DIN 7080 (max. 280 °C) Quartz
⑥ ⑦	**Nuts** **Bolts or studs**	5.6 / 5.2	A2 / A4

* Other materials not mentioned in the above table may also be delivered.

Mounting:

After having correctly welded the base flange ① onto or into the vessel wall, the gasket ②, the glass disc ④, the gasket ③ and the cover flange ⑤ are mounted one after the other and then the nuts ⑥ (in case of studded base flange ①) progressively crosswise tightened against the studs ⑦. The above indicated tightening torque values have to be strictly respected. Additional information may be taken from the DIN specification 28120.

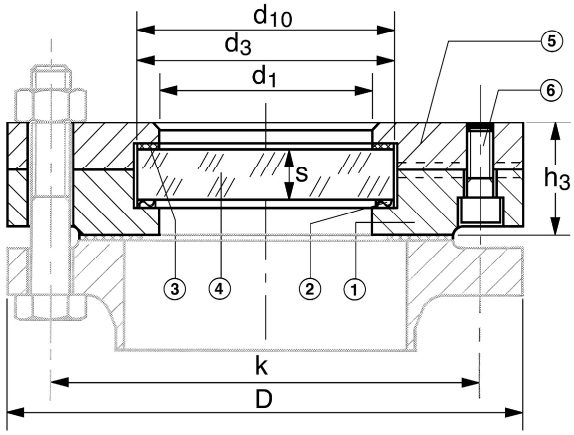
Circular sightglass fittings to DIN 28121 (PN 10, 25)

Dimensions
Assembly and construction materials
Mounting

Our circular sightglass fittings to be mounted directly onto a welding flange, pad or similar correspond in their construction and assembly to the dimensions and constructional guidelines of the DIN specification 28121. The sightglass fittings are completely premounted at manufacturer's works to form an integral, sealed, finished unit. The maximum operating temperature is limited to 200 °C. For higher operating temperatures, versions similar to DIN 28121 can be delivered on request, these with other seal and/or glass qualities.
The units may be used until –1 bar. For operating temperatures lower than –10 °C, please consult the descriptive sheet AD 2000 W 10.

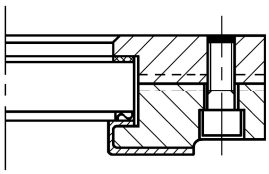
Nominal diameter (DN)	Nominal pressure (PN) (bar)	Viewing diameter		Glass disc		Flanges			Fixation bolts		Gaskets	
		d_1	d_2	d_3	s	D	k	h_3	Number	Size	d_1	d_{10}
40	10	48	43	63	10	150	110	36	4	M 16	48	65
	25				12	150	110	38	4	M 16		
50	10	65	60	80	12	165	125	38	4	M 16	65	82
	25				15	165	125	41	4	M 16		
80	10	80	75	100	15	200	160	46	8	M 16	80	102
	25				20	200	160	50	8	M 16		
100	10	100	95	125	15	220	180	46	8	M 16	100	127
	25				25	235	190	59	8	M 20		
125	10	125	120	150	20	250	210	54	8	M 16	125	152
	25				30	270	220	66	8	M 24		
150	10	125	120	150	20	285	240	54	8	M 20	125	152
	25				30	300	250	66	8	M 24		
200	10	150	145	175	20	340	295	54	8	M 20	150	177
	25				30	360	310	66	12	M 24		

Version A Without protective coating of sealing face



The design shows the sealing face of form B1

Version B
With protective coating of sealing face



Assembly and construction materials:

①	**Base flange** (Version A) Form B1: Raised faced to DIN EN 1092-1 (standard) Form C: Tongue to DIN EN 1092-1 Form E: Male socket to DIN EN 1092-1 **Base flange** (Version B) (only deliverable with sealing face of form B and E)	Boilerplate H II to DIN 17155 Stainless steel 1.4571 (= AISI 316 Ti) to DIN 17440 Other materials on demand Boilerplate H II with coated sealing surface. (The maximum admitted temperature of the coating has to be respected)
②	**Gasket** product side	PTFE-covered ring gasket with internal support ring
③	**Gasket** cover side	KLINGERsil C 4400
④	**Glass disc**	Borosilicate to DIN 7080 (max. 280 °C)
⑤	**Cover flange**	Boilerplate H II to DIN 17155 Stainless steel 1.4541 (= AISI 321) Stainless steel 1.4571 (= AISI 316 L) Other materials on demand
⑥	**Security tightening bolts**	5.6 / 5.2, A4

Mounting:

By using the fixation bolts of which the number and size are indicated in the above table, the complete, premounted, tightened and sealed unit is fixed onto a welding flange, pad or similar.

Possible standard combinations of the CHEMLUX®, EdelLUX®, fibroLUX®, miniLUX® and metaLUX® light fittings with sightglass units to DIN 28120 / 28121

VETROLUX® illuminated sightglass unit, consisting of sightglass to DIN 28120, DN 150, PN 10, with mounted CHEMLUX® light fitting, type KEL 20 deH Sch B, 230 V, 20 W, Ex de IIC T4, Ex tD A21 IP65 T130°C, Ex II 2 G + D, with anti-dazzle shield “B”, in version “view **and** light through **one** assembly”

VETROLUX® illuminated sightglass unit, consisting of sightglass to DIN 28120, DN 80, PN 10, with mounted CHEMLUX® light fitting, type F 20dHNsp, 24 V, 20 W, Ex d IIC T5, Ex tD A21 IP65 T95°C, Ex II 2 G + D

The table below indicates the possible standard combinations of our light fitting series with the respective nominal diameters of sightglasses to DIN 28120 / 28121:

Nominal diameter (DN)			40		50		80		100		125		150		200	
Sightglass to DIN 28120 (A) Sightglass to DIN 28121 (B)			A	B	A	B	A	B	A	B	A	B	A	B	A	B
Series	Types	Fixation														
20	F 20 dH / L 20 deH R 50 deH / R 100 deH	… N			●	●	●	●	●	●						
		… Z							●		●		●			
		… Sch							●		●		●		●	
100	100 deH	… N					●	●	●	●	●	●	●			●
		… Z											●		●	
		… Sch									●		●		●	
KVL	KVL 20 H (D)	… Sch			●	●	●	●	●	●	●	●	●	●	●	●
	KVL 50 H (D)	… Sch			●	●	●	●	●	●	●	●	●	●	●	●
	KVL 100 HD	… Sch			●	●	●	●	●	●	●	●	●	●	●	●
KVLR / BKVLR	KVLR 20 H(D)/BKLVR 20 H(D)	… W/Sch	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	KVLR 50 H(D)/BKLVR 50 H(D)	… W/Sch	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	KVLR 100 HD/BKLVR 100 HD	… W/Sch	●	●	●	●	●	●	●	●	●	●	●	●	●	●
KLR	KLR 05 / 10 / 20 / 50 / 100	… Sch	●	●	●	●	●	●	●	●	●	●	●	●	●	●
HL	HL 50 H				●			●								
	HL 80 H						●			●						
	HL 100 H								●			●		●		
	HL 125 H										●					
	HL 150 H												●			●
	HL 200 H														●	
F(L)KEL/ (L)KEL / KL	F(L)KEL 5, 10, 20, 50 dH (L)KEL 5, 10, 20, 50 deH KL 5, 10, 20, 50, 100 H	… W					●	●	●	●	●	●	●	●	●	●
		… Sch	●	●	●	●	●	●	●	●	●	●	●			●
PEL / PL	PEL 20 deH / PEL 50 deH PL 20 H / PL 50 H / PL 100 H	… Sch									●	●	●	●	●	●
		… X1			●	●	●	●	●	●	●	●	●	●		●
		… X2									●		●		●	
EdelEx	EdelEx 5 dH / 10 dH / 20 dH	… Sch	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	EdelEx G 20 dH / 50 dH	… Sch					●	●	●	●	●	●	●	●	●	●
fibroLUX		… W2	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		… W3	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Do you wish for more information about our wide range of light fittings for use in hazardous or safe areas, camera systems for hazardous areas, about our range of circular sightglasses to DIN 28120/28121, screwed sightglasses similar to DIN 11851, rectangular or D-ended sightglasses, pipeline flow indicators, sideways or centrally operated wipers, hinged sightglasses, spraying devices or our complete sight and light-glass units VETROLUX®? Are you interested in other types, special versions or different protection degrees? If yes, please contact us, our branch office or our local agents – it is our business! You will find the necessary indications about our sales network on the Internet.

Branch office / exclusive agent:

All dimensions in mm. Subject to changes without preliminary notice.

MAX MÜLLER AG

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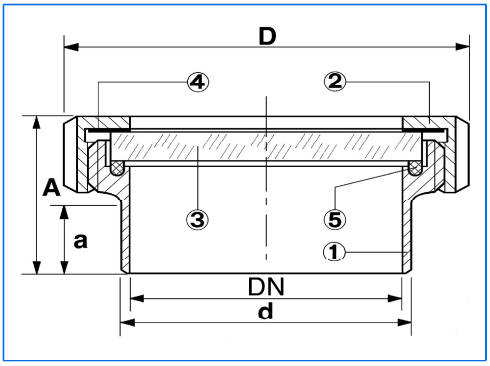
05.11

Screwed dairy sightglasses

similar to DIN 11851

Series SSA

Screwed sightglass, DN 100, PN 6, type SSA 100



Type	DN	a	A	d	D
SSA 50	50	18	46	55	92
SSA 65	65	22	49	72	112
SSA 80	80	23	54	87	127
SSA 100	100	32	65	106	148
SSA 125	125	20	60	132	178
SSA 150	150	15	62	157	210

Branch office / exclusive agent:

All dimensions in mm. Subject to changes without preliminary notice.

Application:
Screwed dairy sightglasses of the series SSA are used for the visual control of processes inside vessels, storage tanks, mixers, reactors etc. They are preferably used in pharmaceutical, cosmetics and food processing industries (milk industry, breweries, pharmaceutical plants etc).
They may be sterilised due to the high operating temperatures admitted.

Construction and standard materials:
Our delivery normally contains (standard version):

① Welding flange	AISI 316 L (1.4404)
② Grooved collar nut	AISI 304 (1.4301) or AISI 304 L (1.4307)
③ Glass disc	Sodium silicate to DIN 8902 (max. 150 °C) or Borosilicate to DIN 7080 (max. 280 °C)
④ Gasket	PTFE
⑤ Gasket product side	Silicone

Special versions (On demand)**:**
Special steel qualities for ① and ②
EPDM, PTFE or Viton for ⑤
Aseptic design
Gasket product side with certificate FDA
Welding flange with thick wall to old DIN standards

Conditions of service:

Pressure:	Max. 6 bar
Vacuum	
Temperature:	Depending on gasket quality
Special conditions:	On demand

The above indications are only valid for sightglasses **without** wipers of the series W / WD!

Certificates:
To be supplied against extra charge to DIN EN 10204.

Possible combinations with light fittings:

From DN 50:	With light fittings EdelLUX®, series EdelEx
	With light fittings miniLUX®, series KVL/KVLR/BKVLR
	With fibre optic light fittings fibroLUX®
From DN 65:	With light fittings metaLUX®, series HLM / HLMR
	With light fittings CHEMLUX®, series F(L)KEL / (L)KEL / KL
From DN 80:	With light fittings miniLUX®, series KLR
	With light fittings CHEMLUX®, series PEL / PL

From DN 65 on, metaLUX® light fittings of the series HLM may be mounted **together** with wipers of the series W / WD. (See separate data sheet)
In case of order of combined units, the necessary adaptation of the grooved collar nut is made in our works.

Do you wish for more information about our wide range of light fittings for use in hazardous and safe areas, about our range of circular sightglasses to DIN 28120/28121, screwed sightglasses similar to DIN 11851, rectangular or D-ended sightglasses, pipeline flow indicators, centrally or sideways operated wipers, hinged sightglasses, spraying devices or our complete sight and lightglass units VETROLUX®? Are you interested in other types, special versions or different protection degrees? If yes, please contact us, our branch office or our local agents – it is our business! You will find the necessary indications about our sales network on the Internet.

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05.06

Double glazed sightglasses similar to DIN 28120, with or without heating element

Double glazed sightglass similar to DIN 28120, DN 150, PN 16, with integrated heating element, 24 V, 50 W

For use with nominal pressures of PN 6 / PN 10 / PN 16

Application:
For cases where undesired condensation and product deposits on the inner side of the glass discs have to be avoided.
The sightglasses contain two independent glass discs built into an intermediate ring. The heating element is built into the intermediate ring. The sightglasses are delivered to be welded into or onto a vessel wall. Dimensions to DIN 28120, except the height.

Maximum allowed temperatures:
280 °C with glass discs in borosilicate to DIN 7080
150 °C with glass discs in sodium silicate to DIN 8902
Above indicated temperatures may change depending on the quality of the gaskets.

Nominal diameters:
DN 50 - DN 200 (free view from 80 mm to 225 mm)

Materials:

Base flange:	Boilerplate, stainless steels, Titanium, Hastelloy etc.
Gaskets:	KLINGERsil C 4400, Silicone, PTFE etc.
Sightglass discs:	Sodium silicate to DIN 8902 Borosilicate to DIN 7080
Intermediate ring:	Boilerplate, stainless steels, Titanium, Hastelloy etc.
Cover flange:	Boilerplate, stainless steels, Titanium, Hastelloy etc.
Tightening bolts:	8.8, A2, A4

Electrical data:

Supply voltage:	24 V (AC or DC)
Nominal rating:	50 / 75 / 100 W (not regulated)

Further applications:
- **Spoiling** with cooling liquids e.g. to prevent non allowed elevated glass temperatures
- **Leak control**, e.g. by spoiling with inert gases and concentration monitoring or measuring pressure differences

Options:
- Also available without heating element
- Security version

Possible combinations:
Above sightglasses may be combined with our sightglass light fittings of the series CHEMLUX®, EdelLUX®, fibroLUX®, miniLUX® or metaLUX®. With integrated heating element, the use is restricted to safe area applications.

Certificates:
To be supplied against extra charge to DIN EN 10204.

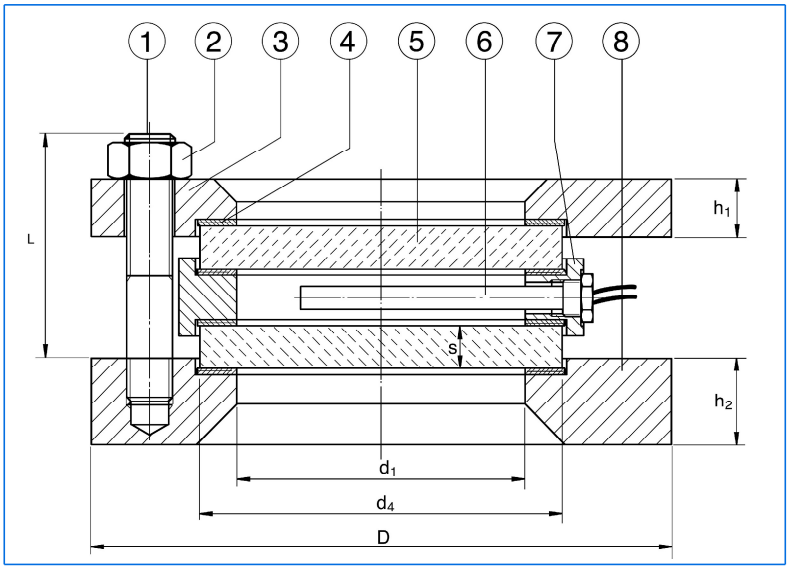
MAX MÜLLER AG
Your reliable and efficient partner in sightglasses.
Perfect, thoroughly engineered solutions from one hand!
Always an interesting, technically advanced idea ahead!

VETRO MM LUX ®

Double glazed circular sightglasses similar to DIN 28120 with heating element

Dimensions / Assembly
Mounting instructions

Nominal Diameter (DN)	Pressure rating (PN)	Viewing Diameter d1	Glass discs		Base flange and cover flange				Bolts or studs / nuts			
			d4	s	D	k	h1	h2	L	Number	Size	Tightening torque (Nm)
50	6	80	100	10	165	125	16	30	65	4	M16	28
	10			15					65			
	16			15					75			32
80	6	100	125	15	200	160	18	30	75	4	M16	
	10			15			20		75	8		20
	16			20			20		95	8		23
100	6	125	150	15	220	180	18	30	75	8	M16	
	10			20			22		90			26
	16			25			22		100			30
125	6	150	175	20	250	210	18	30	85	8	M16	
	10			20			25		90			32
	16			25			25		100			34
150	6	175	200	20	285	240	18	36	85	8	M20	
	10			25			30		110			47
	16			30			30		120			54
200	6	225	250	25	340	295	20	36	100	8	M20	
	10			30			35		125			63



Assembly and construction	
1	Bolts or studs
2	Nuts
3	Cover flange
4	Gaskets
5	Glass discs
6	Heating element
7	Intermediate ring
8	Base flange

Mounting:

After having correctly welded the base flange ⑧ onto or into the vessel wall, the gaskets ④, the glass discs ⑤, the intermediate ring ⑦ as well as the cover flange ③ are positioned one after the other and then the nuts ② progressively tightened against the bolts or nuts ①. The above indicated tightening torque values (in Nm) have to be strictly respected. The nuts have to be tightened over cross. Additional information may be taken from the DIN specification 28120. The heating element ⑥ (50, 75 or 100 W) has to be screwed into the intermediate ring ⑦ and to be connected via a temperature regulation device to 24 V AC or DC supply.

All dimensions in mm. Subject to changes without preliminary notice.

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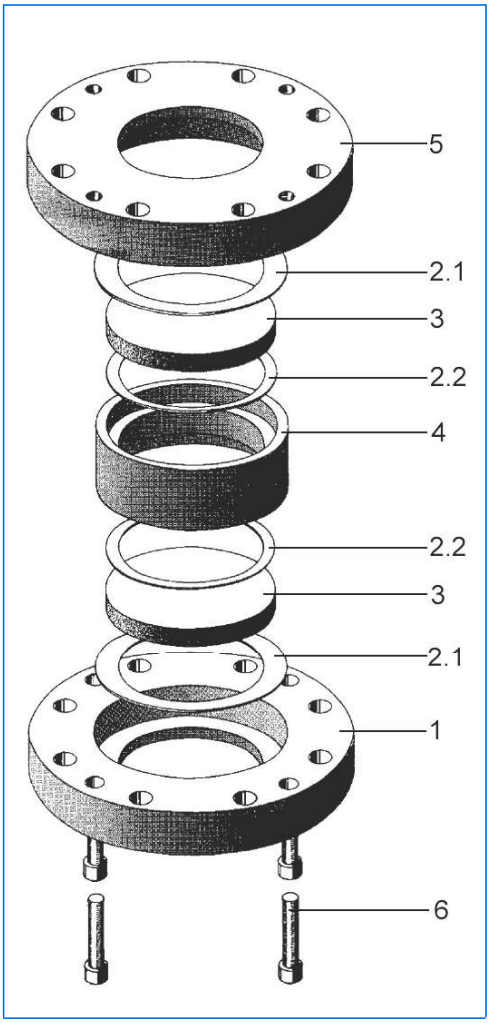
05.06

Double glazed security sightglasses similar to DIN 28121

Double glazed safety sightglass similar to DIN 28121, DN 125, PN 10



For use with nominal pressure of PN 10 (higher pressures on demand)

Application:
For cases where the possible destruction of a single sightglass would present a considerable safety risk.
The sightglasses contain two independent glass discs built into an intermediate support ring. The damage of one disc doesn't affect the guaranteed security of the unit.
The preassembled units are to be screwed onto existing pre-welded, base or other flanges.
Dimensions to DIN 28121, except the height.

Maximum allowed temperatures:
280 °C with glass discs in borosilicate to DIN 7080
150 °C with glass discs in sodium silicate to DIN 8902
The above indicated temperatures may change depending on the quality of the gaskets

Nominal diameters:
DN 50 - DN 200 (free view from 65 mm to 175 mm)

Construction and materials:

Pos.:	Part:	Material:
1	Base flange	Boilerplate, stainless steels, Titanium, Hastelloy etc.
2.1 / 2.2	Gaskets	KLINGERsil C 4400, Silicone, PTFE etc.
3	Sightglass discs	Sodium silicate to DIN 8902 Borosilicate to DIN 7080
4	Intermediate support ring	Boilerplate, stainless steels, Titanium, Hastelloy etc.
5	Cover flange	Boilerplate, stainless steels, Titanium, Hastelloy etc.
6	Tightening bolts	8.8, A2, A4

Option:
Also available as **heated** version to prevent condensation or deposits on the glass discs.
Electrical data:
Supply voltage: 24 V (AC or DC)
Nominal rating: 50 / 75 / 100 W (not regulated)

Further applications:
- **Spoiling** with cooling liquids e.g. to prevent non allowed elevated glass temperatures
- **Leak control**, e.g. by spoiling with inert gases and concentration monitoring or measuring pressure differences

Possible combinations:
Above sightglasses may be combined with our sightglass light fittings of the series CHEMLUX®, EdelLUX®, fibroLUX®, miniLUX® or metaLUX®. With integrated heating element, the use is restricted to safe area applications.

Certificates:
To be supplied against extra charge to DIN EN 10204.

VETRO MM LUX ®

Double glazed security sightglasses similar to DIN 28121

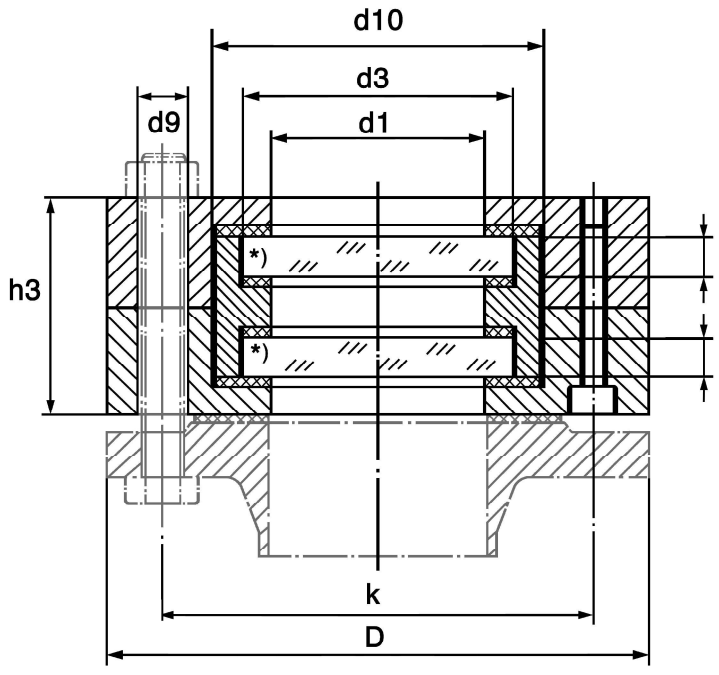
Dimensions / Assembly
Mounting instructions

Nominal diamter (DN)	Viewing diameter d1	Glass discs		Base flange and cover flange			Gaskets			Tightening bolts **		
		d3	s	D	k	h3	d10	d1	d4 *	Number	Size	d9
50	65	80	10	165	125	77	97	50	82	4	M16	18
80	80	100	15	200	160	81	127	80	102	8	M16	18
100	100	125	15	220	180	85	152	100	127	8	M16	18
125	125	150	20	250	210	102	177	125	152	8	M16	18
150	150	175	20	285	240	102	202	150	177	8	M20	22
200	175	200	20	340	295	102	227	175	202	8	M20	22

* The dimension d4 (not shown) is the dimension d3 + 2 mm each. The dimension d4 is the outside diameter of the inner gaskets.

** Not contained in our delivery

Construction:



Mounting:

By using the fixation bolts of which the number and size are indicated in the above table, the complete, premounted, tightened and sealed unit is fixed onto a welding flange, pad or similar. The heating element (optional) has to be connected via a temperature regulation device to 24 V AC or DC.

All dimensions in mm. Subject to changes without preliminary notice.

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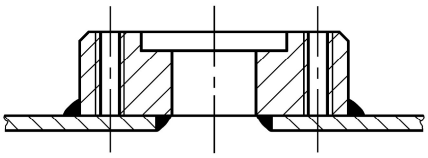
D-ended, elongated sightglasses

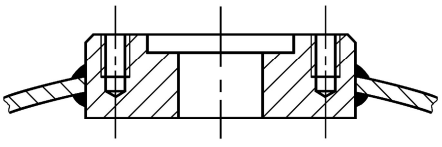
Series LSG / LSGR / LSGRR

D-ended, elongated sightglass type LSGRR 316 Ti - 304 -2,5-2-SL-8903-KLINGERsil-Silicone. Version with blind tappings, base and cover flange in stainless steel, PN 2,5, glass plate to DIN 8903, seals KLINGERsil C4400 / silicone, dimensions 341 x 116 mm.

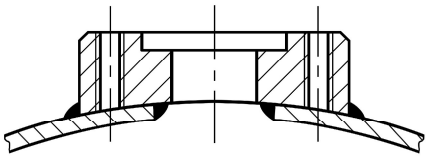
Base flange with



tappings drilled through (DB)



blind tappings (SL)



radiused back (R)

Standard versions

Application:
Elongated sightglasses VETROLUX® of the series LSG / LSGR / LSGRR may be used to observe the interior of reactors, columns, silos, vessels, storage tanks, pipelines or as liquid level indicators. They are delivered ready to be welded into or onto a vessel wall, complete with appropriate seals, glass plate and cover bolts. The D-end shape facilitates easier machining of the vessel wall prior to welding in the unit.

Operating conditions:
Nominal pressure 2,5 / 6 / 10 / 25 bar (see table overleaf)
Vacuum
Note: The nominal pressure indicated refers to the design base of the sightglass. When welded into the vessel concerned, the base frame becomes part of the vessel wall. It is necessary, therefore, that appropriate strength calculations are made on all vessels concerned with respect to the design pressure and size of the vessel and in accordance with the relevant design code. If found to be necessary, reinforcement of the vessel wall has to be carried out.
Operating temperatures:
100 °C max. with sodium silicate glass to DIN 8903
243 °C max. with borosilicate glass to DIN 7081
Note: The above indicated temperatures refer to the use of unprotected glass plates, with no protective mica sheets.

Standard materials:

Base flange:	Boiler plate RSt 37-2 / HII / AISI 316 Ti / AISI 316 L
Cover flange:	Boiler plate RSt 37-2 / HII / AISI 304 / AISI 316 Ti / AISI 316 L
Glass plates:	Sodium silicate to DIN 8903
(Transparent)	Borosilicate to DIN 7081
Seals:	KLINGERsil C4400
	EPDM
	Silicone
	PTFE
Cover bolts	Carbon steel, zinked, quality 8.8
to DIN 912:	Stainless steel A2-70

Other materials on request.

Certificates:
To be supplied against extra charge to DIN EN 10204.

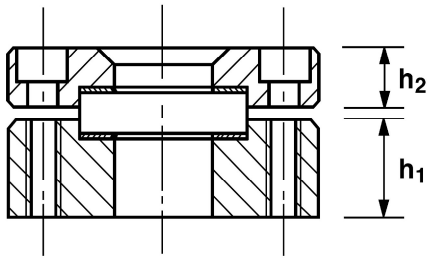
Standard versions: (see left)
- Base flange with bolt tappings drilled through (dimensions see table overleaf), type designation – DB
- Base flange with blind tappings, type designation – SL
- Base flange with radiused back (to correspond to vessel radius), type designation – R

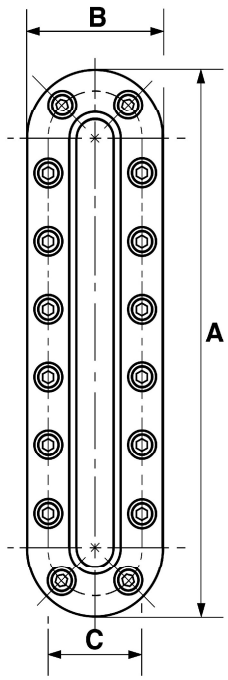
Options:
- Version with double glasses (**not** available for PN 25).
- Fluted glass plate for liquid level indication (**only** available for PN 25).
- Special dimensions.
- Closed back (base flange) version with drilled and tapped holes at the ends for pipe connections so that the unit may be used as an external gauge of a liquid level.

Type designation:
- Series LSG: Base and cover flange in boiler plate RSt 37-2
- Series LSGR: Base flange in stainless steel
  Cover flange in boiler plate RSt 37-2
- Series LSGRR: Base **and** cover flange in stainless steel

Ordering example:
For an elongated, D-ended sightglass of nominal pressure 10 with base and cover flange in AISI 316 / AISI 304 and the base flange in version b) with blind tappings together with a glass plate of sodium silicate to DIN 8903 and overall dimensions of 350 x 80 mm, seals PTFE base side, KLINGERsil C4400 cover side, cover bolts A2-70, the correct designation would be:
1 piece type LSGRR 10-3, 1.4571 / SL - PTFE - 8903 - C4400 -1.4301 - A2.

Survey on standard types
Dimensions





Branch office / exclusive agent:

Type LSG LSGR LSGRR	Nominal pressure (PN)	Dimensions A	B	Free view Length	Width	Screws M10 Number	C	Glass plate dimensions	Thickness of the flanges h_1	h_2	Weight (kg)
2,5-1	2,5	266	116	200	50	8	94	70/10 x 220	25	15	6,3
2,5-2	2,5	341	116	275	50	10	94	70/10 x 295	25	15	7,6
2,5-3	2,5	416	116	350	50	12	94	70/10 x 370	25	15	9,8
2,5-4	2,5	491	116	425	50	14	94	70/10 x 445	25	15	11,0
2,5-5	2,5	566	116	500	50	16	94	70/10 x 520	25	15	12,3
2,5-6	2,5	641	116	575	50	18	94	70/10 x 595	25	15	14,2
2,5-8	2,5	791	116	725	50	22	94	70/10 x 745	25	15	18,0
6-1	6	261	96	195	30	10	74	50/10 x 215	25	15	5,6
6-2	6	316	96	250	30	12	74	50/10 x 270	25	15	7,0
6-3	6	371	96	305	30	14	74	50/10 x 325	25	15	8,0
6-4	6	426	96	360	30	16	74	50/10 x 380	25	15	8,9
6-5	6	481	96	415	30	18	74	50/10 x 435	25	15	10,0
6-6	6	536	96	470	30	20	74	50/10 x 490	25	15	12,0
6-8	6	646	96	580	30	24	74	50/10 x 600	25	15	13,7
10-1	10	260	80	198	18	12	58	35/10 x 215	25	15	5,0
10-2	10	305	80	243	18	14	58	35/10 x 260	25	15	5,8
10-3	10	350	80	288	18	16	58	35/10 x 305	25	15	6,5
10-4	10	395	80	333	18	18	58	35/10 x 350	25	15	7,5
10-5	10	440	80	378	18	20	58	35/10 x 395	25	15	8,0
10-6	10	485	80	423	18	22	58	35/10 x 440	25	15	9,5
10-8	10	575	80	513	18	26	58	35/10 x 530	25	15	13,0
25-1	25	186	80	121	15	10	58	34/17 x 140	25	20	4,0
25-2	25	211	80	146	15	10	58	34/17 x 165	25	20	4,5
25-3	25	236	80	171	15	12	58	34/17 x 190	25	20	5,0
25-4	25	296	80	231	15	14	58	34/17 x 250	25	20	6,0
25-5	25	326	80	261	15	16	58	34/17 x 280	25	20	6,8
25-6	25	366	80	301	15	18	58	34/17 x 320	25	20	7.5
25-8	25	386	80	321	15	18	58	34/17 x 340	25	20	8,0

All dimensions in mm. Subject to changes without preliminary notice.

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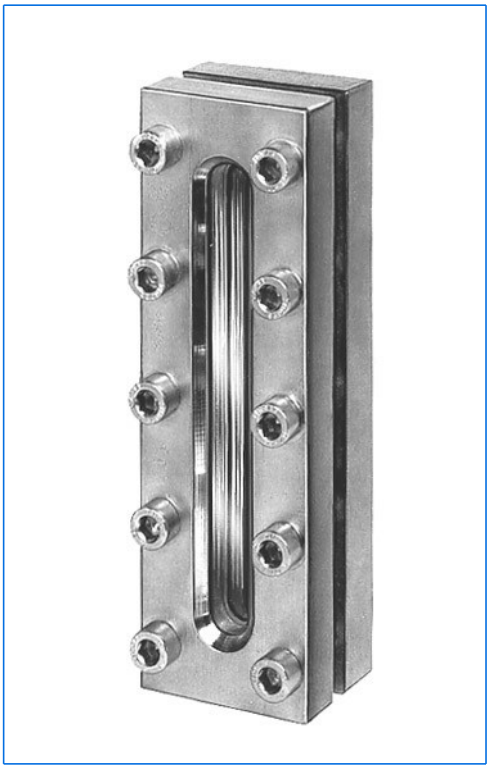
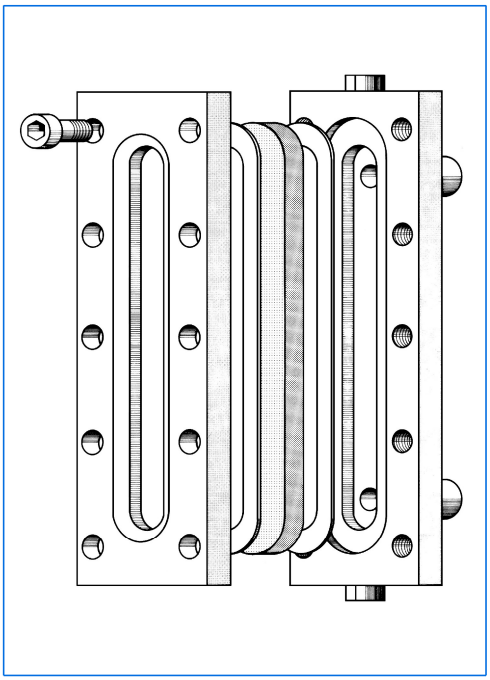
Rectangular sightglass fittings TÜV-approved Series RSG / RSGR / RSGRR Sizes 170 - 1000



Rectangular sightglass fitting, series RSGRR, size 250, with reflex glass



Application:
Rectangular VETROLUX® sightglasses of the series RSG / RSGR / RSGRR may be used to observe the interior of reactors, columns, silos, vessels, storage tanks and pipelines. They serve mainly as liquid level gauges. The are delivered ready to be welded into or onto a vessel wall, complete with the appropriate seals, glass plates, and cover fastenings.

Operating conditions:
Nominal pressure 16 bar
Vacuum
Note: The nominal pressure indicated refers to the design base of the sightglass. When welded into the vessel concerned, the base frame becomes part of the vessel wall. It is necessary, therefore, that appropriate strength calculations are made on all vessels concerned with respect to the design pressure and size of the vessel and in accordance with the relevant design code. If found to be necessary, reinforcement of the vessel wall has to be carried out.
Operating temperatures:
100 °C max. with sodium silicate glass to DIN 8903
243 °C max. with borosilicate glass to DIN 7081
Note: The above indicated temperatures refer to the use of unprotected glass plates, with no protective mica sheets.

Standard materials:

Base frame:	RSt 37-2 or HII (boiler plate) / AISI 316 Ti stainless steel
Cover frame:	As base frame
Glass plate:	Toughened sodium silicate glass to DIN 8903 (max. 100 °C)
	Toughened borosilicate glass to DIN 7081 (max. 243 °C)
Gaskets:	KLINGERsil C4400 / Neoprene
	PTFE / Viton
Cover fastenings:	Steel, quality 8.8 / Stainless steel

Other materials on request.

Certificates:
To be supplied against extra charge to DIN EN 10204.

Options:
- Version with closed base frame (drawing left) to be used as an external liquid level gauge with top and bottom pipe connections. For this application, the base frame will be supplied appropriately drilled and tapped.
- Radiused base frame to suit vessel wall
- Clear (transparent) glass plate
- Alternative versions in shape and size

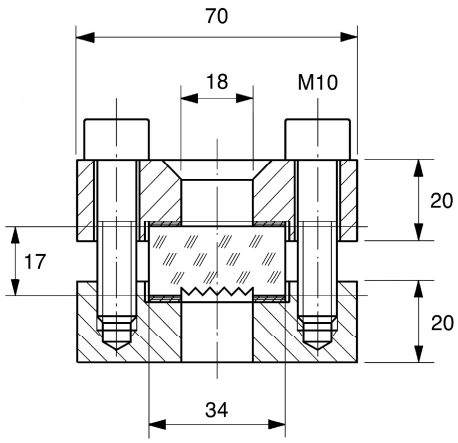
Remarks:
The TÜV approval does **not** apply to the base flange as this is considered as part of the vessel wall after welding. Standard delivery includes a reflex (fluted) glass plate. In circumstances where a clear (transparent) glass plate is required, this must be **clearly stated** at the time of enquiry.
After welding into the vessel, the base frame should be checked to ensure that the sealing surface is flat and has not become distorted to avoid possible leakage under pressure and / or breakage of the glass plate during tightening of the cover frame bolts. This process should be carried out in several steps and progressively alternating between each pair of opposite bolts from one end of the frame to the other! Tighten first little, then repeat the operation.

Type designation:

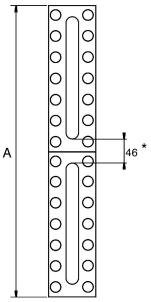
• Series RSG:	Base and cover frame in steel RSt 37-2
• Series RSGR:	Base frame in AISI 316 Ti and cover frame in RSt 37-2
• Series RSGRR:	Base and cover frame in AISI 316 Ti

Ordering example:
1 piece rectangular sightglass, base frame in AISI 316 Ti, cover frame in RSt 37-2, length 350 mm, glass plate in sodium silicate glass to DIN 8903, fluted (Reflex), gasket product side PTFE, cover side Neoprene, cover fastenings 8.8 zinked:
1 piece type RSGR-350, 1.4571 - PTFE - 8903 R - Neoprene - RSt 37-2 - 8.8 zink.

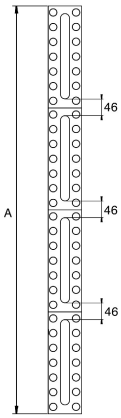
Survey of standard types
Dimensions



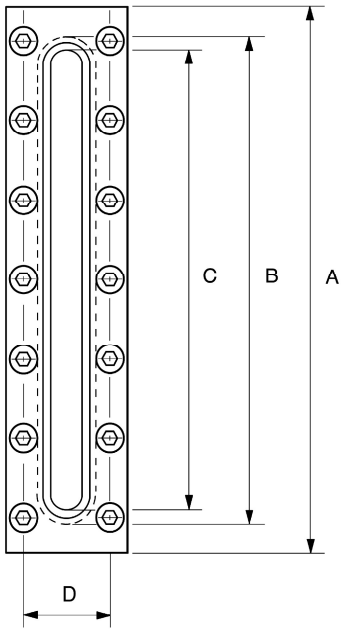
Depending on the overall length of the sightglass, the cover frames are made to a maximum unit length A, and the base frame interrupted by bridges which correspond to this length. This strengthens the base frame and reduces the maximum length of the individual glass pieces required to cover the whole length, thus reducing the possibility of glass breakages when the cover frames are tightened down. When selecting the overall length of the sightglass, and the number of units this will involve, due note should be taken to ensure that the liquid level to be observed normally falls into one of the visible sections. (If this is not possible, then consult us for our series of D-ended sightglasses LSG / LSGR / LSGRR)



* 36 for size 600



Size(s)	170 - 400	500 - 800	1000



Type	Size	Length A	Number of units	Free view C	Glass-length B	Bolts number	Bolts D	Weight (kg)
RSG RSGR RSGRR	170	170	1	124	140	8	50	2,70
RSG RSGR RSGRR	250	250	1	204	220	10	50	4,40
RSG RSGR RSGRR	300	300	1	264	280	14	50	5,00
RSG RSGR RSGRR	350	350	1	304	320	16	50	6,00
RSG RSGR RSGRR	400	400	1	354	370	18	50	7,00
RSG RSGR RSGRR	500	500	2	2 x 204	2 x 220	20	50	9,10
RSG RSGR RSGRR	600	600	2	2 x 264	2 x 280	28	50	10,50
RSG RSGR RSGRR	700	700	2	2 x 304	2 x 320	32	50	12,00
RSG RSGR RSGRR	800	800	2	2 x 354	2 x 370	36	50	14,00
RSG RSGR RSGRR	1000	1000	4	4 x 204	4 x 220	40	50	17,00

Branch office / exclusive agent:

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04.09

Hinged sightglasses

with or without illumination
series KSGB / KSG

Hinged illuminated sightglass type KSGB 125. Terminal voltage of built-on light fitting 24 V, nominal rating 50 or 100 watts. Built-in wiper, series W.

The hinged sightglasses of the series KSG / KSGB represent the combination of an illuminated / non illuminated sightglass with a mechanism for quick and easy opening and closing of the combined unit.

Application: Mainly where a chemical or physical process needs a quick addition of components (e.g. of a powder or a liquid) or where samples of the vessel contents have to be taken regularly or sporadically for control purposes. **The application of the standard version of the illuminated units is restricted to safe area use.**

Conditions of service:

Maximum pressure inside the vessel:	Type KSG(B) 125: 1.0 bar Type KSG(B) 200: 0.5 bar
Vacuum	
Maximum temperatures:	200 °C with glass disc of borosilicate (DIN 7080) 150 °C with glass disc of sodium silicate (DIN 8902) Higher temperatures on demand. With mounted metaLUX light fitting with push-button, the temperature inside the connection box should not exceed 100 °C.

ATTENTION: **Never open under pressure!**

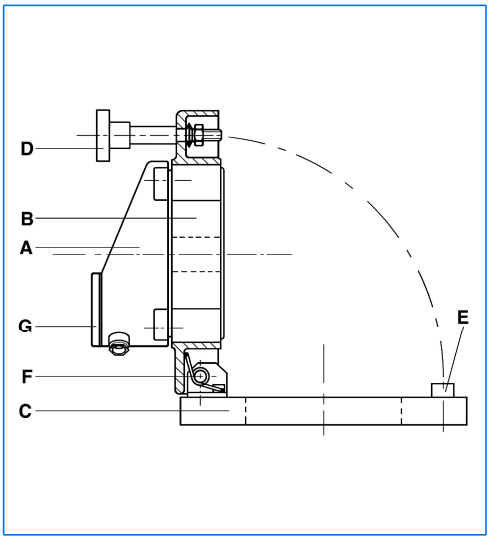
Electrical caracteristics: (For type KSGB **with** mounted light fitting)

Supply:	AC or DC
Terminal voltage:	24 V (12 V possible)
Nominal rating:	50 / 100 W (see table overleaf)
Bulbs:	Halogen, socket GY 6.35

Transformers in protection modes IP 00 or IP 65 for different primary voltages may be supplied on demand.

Enclosure protection degree: IP 65, dust and water jet tight to EN 60529 / DIN VDE 0470 part 1.

Mounting: The unit is supplied completely premounted. Before welding of the flange, the light fitting with the hinge mechanism have to be separated from it.



Typical assembly of a hinged illuminated sightglass series KSGB.

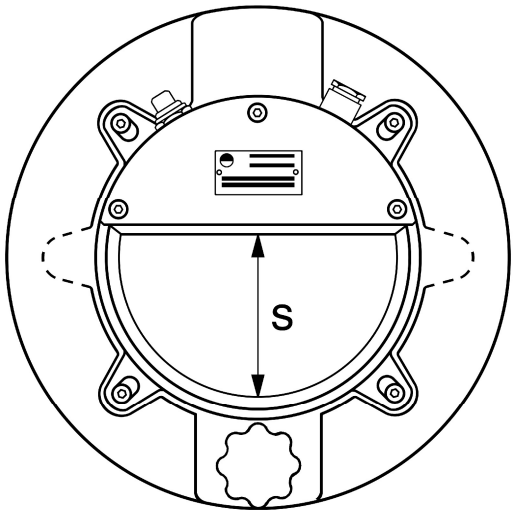
Assembly:
The picture left shows the typical construction elements:
A) Light fitting metaLUX, series HL
B) Light fitting holder
C) Welding flange
D) Closing bolt with grip head
E) Closing head
F) Tilting hinge
G) Cover of the metaLUX light fitting

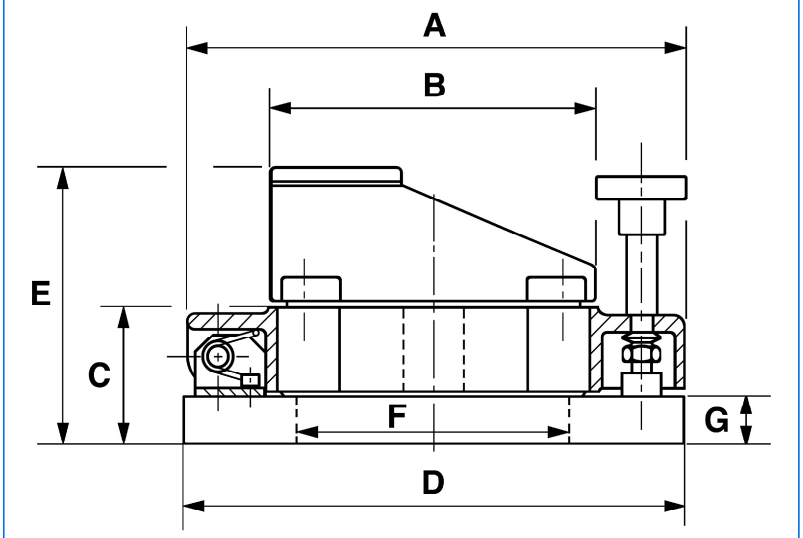
Options:
- Wiper series W / WD (see separate data sheet)
- Delivery **without** light fitting. (Correct type designation is then KSG).
- Light fitting for use in hazardous areas
- Pieces in contact with the medium in stainless steel

Replacement of the bulb: The bulb may be changed under pression or vacuum after opening of the cover G): After loosening of its socket, the bulb can be replaced.

Attention: Do only touch with a proper cloth!

Dimensions
Electrical caracteristics
Materials of construction





Type		KSG(B) 125	KSG(B) 200
	A	248	333
	B	162	245
	C	70	80
	D	250	335
	E	140	175
	F	136	205
	G	25	25
	S	80	140
Terminal voltage	V	24 / 12	24 / 12
Nominal rating	W	50 / 100	50 / 100

Materials of construction:

- Light fitting / light fitting holder: Corrosion resistant cast aluminium alloy. (On demand painted RAL 9001).
- Welding flange: Carbon steel (RSt 37-2) or stainless steel 1.4571 (= AISI 316 Ti) (Standard). 1.4541 (=AISI 321) / 1.4301 (=AISI 304) or other materials on demand.
- Glass disc: Sodium silicate to DIN 8902 or Borosilicate to DIN 7080
- Sealings: Perbunan (Standard) Silicone, Viton
- Closing parts: Carbon steel, zinked and cast aluminium alloy
- Head of grip: Plastic

Do you wish for more information about our wide range of light fittings for use in hazardous and safe areas, camera systems for hazardous areas, about our range of circular sightglasses to DIN 28120/28121, screwed sightglasses similar to DIN 11851, rectangular or D-ended sightglasses, pipeline flow indicators, centrally or sideways operated wipers, hinged sightglasses, spraying devices or our complete sight and lightglass units VETROLUX®? Are you interested in other types, special versions or different protection degrees? If yes, please contact us, our branch office or our local agents – it is our business! You will find the necessary indications about our sales network on the Internet.

Branch office / exclusive agent:

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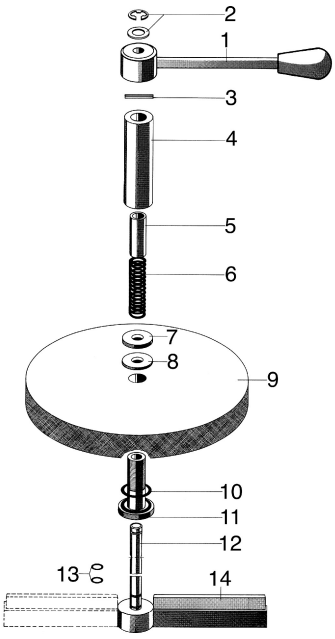
05.11

Wipers

for sightglass discs
Series W / WD / WDT / WR / WDR

Type W(D)



Construction:

1	Handling arm
2	Circlips
3	Fixation pin
4	Distance piece
5	Inner bush
6	Tension spring
7	Spring washer
8	Gasket
9	Glass disc
10	O-Ring
11	Fixation bush
12	Wiper-blade holder
13	O-Rings for holder
14	Wiper-blade

Type WDT

Application:
Wipers of the series W / WD / WDT / WR / WDR are built into sightglasses similar to DIN 28120 or DIN 11851 to prevent cristallisation of the media inside the vessel onto the inner side of the glass disc or to hold the sightglass free of dust and / or dirt.
The wipers are mounted into glass discs with a centric hole of a diameter of 10,5 mm.

Materials (standard):

Wiper-blade:	PTFE, silicone rubber, silicone rubber FDA
Mechanical parts:	Stainless steel
Glass discs:	Sodium silicate similar to DIN 8902 or Borosilicate similar to DIN 7080 Macrolon on request (only for pressureless operation at ambient temperature)

Operating conditions:

1. Maximum pressure inside the vessel: 2 to 6 bar, depending of the glass diameter (see table overleaf). For higher pressures, please consult us.
2. Vacuum
3. Maximum temperatures: 180 °C with wiper-blade of silicone rubber
   200 °C with wiper-blade of PTFE

Possible combinations (only for wipers fo the series W / WD):
Sightglasses to or similar to DIN 28120:

Series / DN	50	80	100	125	150	200
HL	●	●	●	●	●	●
MVLR	⊙	●	●	●	●	●
BKVLR / BKVLR LED / KVL	⊙	⊙	⊙	●	●	●
fibroLUX / fibroLUX E	X	●	●	●	●	●
KVLR	X	⊙	⊙	●	●	●
KLR	X	X	⊙	⊙	●	●
EdelEx (LED) / (F)(L)KEL / (F)HEL (LED) / KL / FHL	X	X	⊙	⊙	⊙	●

Sightglasses similar to DIN 11851:

Series / DN	50	65	80	100	125	150
HLM / HLMR	X	●	●	●	●	●
MVLR	X	X	⊙	●	●	●
BKVLR / BKVLR LED / KVL	X	X	⊙	⊙	⊙	●
fibroLUX / fibroLUX E	X	X	X	●	●	●
KVLR	X	X	X	⊙	⊙	●
KLR / EdelEx (LED)	X	X	X	X	⊙	⊙
(F)(L)KEL / (F)HEL (LED) / KL / FHL	X	X	X	X	X	⊙

X = Can not be combined ⊙ = May be combined ● = May be combined without restrictions

Type designations:

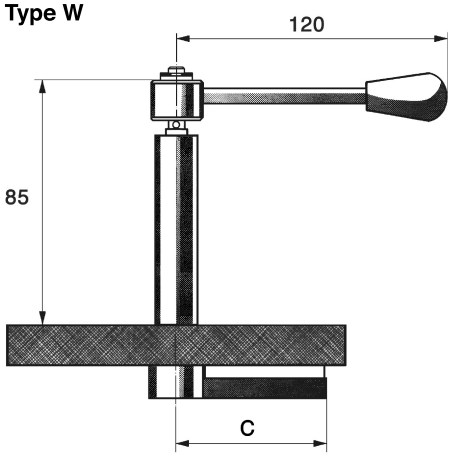
Version with one wiper-blade, manipulation by handling arm and ratch:	Type W
Version with double wiper-blade, manipulation by handling arm and ratch:	Type WD
Version with double wiper-blade, manipulation by T handle:	Type WDT
Version with one wiper-blade, manipulation by knob:	Type WR
Version with double wiper-blade, manipulation by knob:	Type WDR

Additional remarks:

- The glass discs with centric hole and the wipers may be ordered separately. In case of complete orders, they leave our works as premounted units.
- **The wipers for the screwed sightglasses similar to DIN 11851 of the DN 40 are only available with the knob version.**
- **The wipers of the type WDT can only be combined with few series of light fittings. Please consult us.**

Dimensions
Supplementary informations

Type W



The following table is valid for VETROLUX® sightglasses to or similar to DIN 28120.

DN	Free view (mm)	Length of wiper-blade (mm)	Dimensions of the glass disc (diameter x thickness) (mm)	C	Maximum pressure (bar)
50	80	26	100 x 15	38	6
80	100	36	125 x 15	48	4,5
100	125	48	150 x 15	60	3
125	150	61	175 x 15	73	3
150	175	73	200 x 15	85	2
200	225	98	250 x 15	110	2

Special dimensions on demand. (Up to DN 400)

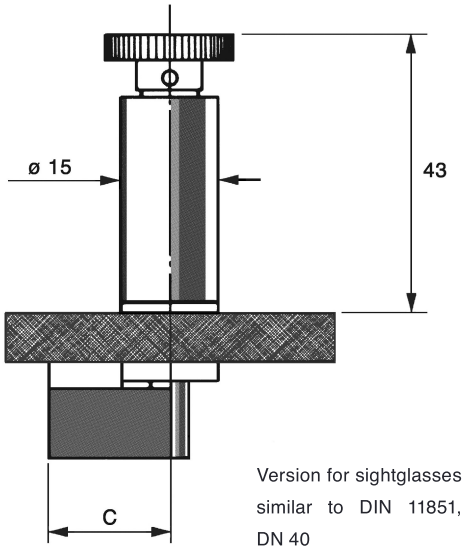
Type W

The following table is valid for screwed sightglasses VETROLUX® similar to DIN 11851.

DN	Free view (mm)	Length of wiper-blade (mm)	Dimensions of the glass disc (diameter x thickness) (mm)	C	Maximum pressure (bar)
40	40	11	51 x 7,5	18	3
65	65	18	84 x 10	30	4
80	80	26	99 x 15	38	6
100	100	36	114 x 15	48	5
125	125	48	147 x 15	60	3
150	150	61	175 x 15	73	3

Special dimensions on demand.

Type WR



Version for sightglasses similar to DIN 11851, DN 40

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03.11

Wipers

Series WS with sideways operated flexible shaft driven wiper blade for circular sightglasses to DIN 28120 or similar

Wiper system WS, built into a VETROLUX® sightglass to DIN 28120, DN 100, PN 10.

Introduction:
Besides the well known wipers of the series W/WD which are – due to their construction principle – limited in their application since they withstand only weak pressure and/or vacuum, the wiper system WS permits to cover a wide spectrum of higher pressure and/or vacuum applications.

Application:
Wipers of the series WS are used for the cleaning of the inner side of sightglasses built into pressure or vacuum vessels. They may be operated in hazardous as well as in safe areas. They fit by means of pressure and vacuum tight glands through the lower and cover flange of circular sightglass units to DIN 28120 or similar of DN 100 to 200.

Operating conditions:
a) Maximum pressure: 16 bar
b) Vacuum
c) Maximum operating temperatures:
180 °C with glass disSc to DIN 7080 (borosilicate) and wiper blade in silicone
200 °C with glass disc to DIN 7080 (borosilicate) and wiper blade in PTFE
150 °C with glass disc to DIN 8902 (sodium silicate)

Wiper system WS, built into a VETROLUX® sightglass to DIN 28120, DN 100, PN 10, with mounted sightglass light fitting miniLUX®, type KVL 50 HDSch, 24 V, 50 W, for combined "view **and** light through **one** assembly".

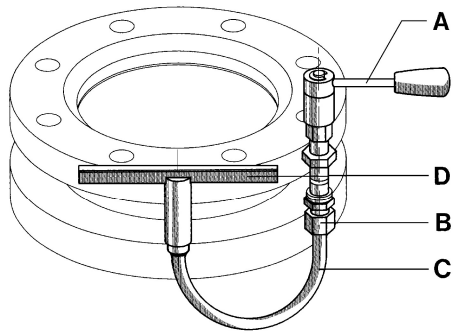
Materials:

Wiper mechanism:	Stainless steel for all parts in contact with the product
Wiper blade:	PTFE or silicone
Sealings:	PTFE (admitted for use in food processing industries)

Possible combinations:
The wiper system WS may be combined with a spraying device of the series SV/SVS as well as with the light fittings of the series CHEMLUX®, EdelLUX®, fibroLUX®, miniLUX® or metaLUX® for use in hazardous or safe areas. The light fittings may be mounted in the versions "light and view through one sightglass assembly" as well as for separate sightglasses.

Delivery:
As a complete set with detailed mounting instructions to be built into existing sightglasses or supplied together with a complete sightglass VETROLUX® to your specifications. In the second case, MAX MÜLLER AG carries out the necessary machining of the welding and the cover flange of the sightglass.

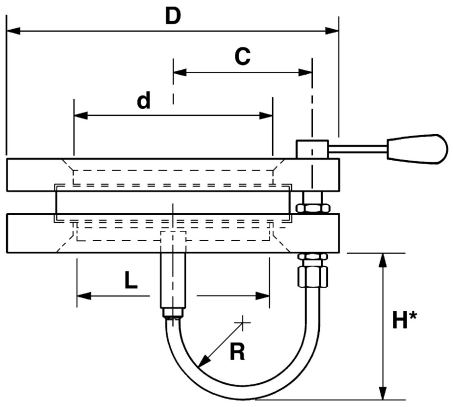
Assembly
Mounting
Dimensions



Assembly drawing of the wiper system WS

The general assembly of the wiper system WS may be seen from the left drawing:
The operating lever A with free-wheel return drives the wiper blade holder D in an uni-directional sense by means of a flexible shaft guided in the distance tube C. The tightness against pressure or vacuum is created by the gland sealings B.
If the wiper system WS is mounted into an existing sightglass, we are supplying detailed and illustrated mounting instructions with the set. If the system is ordered with a VETROLUX® sightglass, the necessary adaptations are carried out in our works.
For a correct delivery of the complete sightglass, we need the following order specifications:

1. Nominal diameter (DN)
2. Nominal pressure (PN)
3. Materials for:
   a) Welding flange (e.g. 316 Ti ≙1.4571)
   b) Cover flange (e.g. carbon steel)
   c) Studs and nuts
   d) Sealings product side and cover side
   e) Glass disc (DIN 7080, borosilicate or DIN 8902, sodium silicate)
   f) Wiper blade (PTFE or silicone)



Type		WS 100	WS 125	WS 150	WS 200
Nominal diameter of the sightglass (DIN 28120)	DN	100	125	150	200
Free view	d	125	150	175	225
Overall diameter of the sightglass	D	220	250	285	340
	C	93	105	120	147,5
	R	36,5	42,5	50	64
	$H^*_{max.}$	105	110	120	130
Wiper blade length	L	120	148	172	222

Branch office / exclusive agent:

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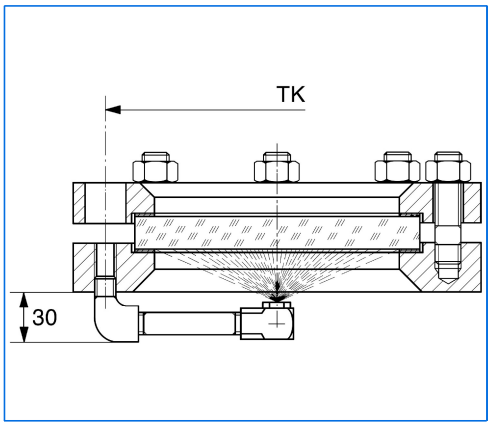
Spraying units
for circular sightglasses to DIN 28120 or similar Series SV

Spraying unit, type SV 4, built into circular sightglass similar to DIN 28120, DN 125, PN 6.



Spraying unit, built into circular sightglass to DIN 28120.

Branch office / exclusive agent:

Application:
VETROLUX® spraying units of the series SV may be used for cleaning the inner face of sightglass discs via an intermittent, continuous or automatically controlled spray. They are suitable in either safe or hazardous areas for all standard sightglasses and may be used both for pressure and vacuum vessels subject to test certification.

Mounting:
The mounting is made by means of a connection piece screwed into the welding flange to form a pressure tight seal and through a clearance hole in the cover flange.

Operating conditions:
These correspond to those of the sightglass used and it's rating.

Materials:
Contact parts: Stainless steel
Gaskets: PTFE

Possible combinations:
The spraying units may be used in conjunction with VETROLUX® wipers of the series W / WD or WS together with the lightfittings of the series CHEMLUX®, EdelLUX®, fibroLUX®, miniLUX® or metaLUX® without any restriction.

Delivery contents:
The complete set consists of a connecting angle piece, a distance tube and the spraying jet head (see drawing left).

Connection:
The connection is made via a hole drilled into the welding flange, G¼". A clearance hole of ø 25 mm in the cover flange is also required.

Remarks:
- Dependent on operating conditions, a suitable non-return valve should be built into the feed tube.
- When the spraying units are ordered **complete** with sightglasses, all the necessary fitting requirements will be carried out at our works, as part of the delivery.

Type	SV 1	SV 2	SV 3	SV 4	SV 5	SV 6
Nominal diameter (DN) to DIN 28120	50	80	100	125	150	200
Pitch circle TK for connection drillings (mm)	132	160	186	210	240	295

Ordering example:
A spraying unit for mounting into a sightglass to DIN 28120, DN 150: 1 piece SV 5.

Important:
When the spraying unit is to be ordered together with a sightglass unit, we need the following information at the point of order:
1) Nominal diameter (DN), 2) nominal pressure (PN) of the sightglass, 3) materials for the welding and the cover flanges, 4) materials for the product and cover side gaskets, 5) quality of the glass disc (borosilicate / sodium silicate) and 6) material for the studs and nuts.

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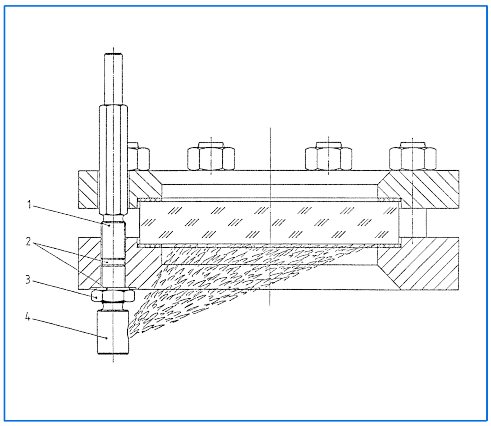
04.03

Spraying units
for circular sightglasses to DIN 28120 or similar Series SVS

Spraying unit of the series SVS



Spraying unit of the series SVS built into circular sightglass to DIN 28120

Branch office / exclusive agent:

Application:
VETROLUX® spraying units of the series SVS may be used for cleaning the inner face of sightglass discs via an intermittent, continuous or automatically controlled spray. They are suitable in either safe or hazardous areas for all standard sightglasses and may be used both for pressure and vacuum vessels subject to test certification. According to your needs, we recommend the mounting of several units into the same sightglass.

Mounting:
The mounting is made by means of a connection piece screwed into the welding flange to form a pressure tight seal and through a clearance hole in the cover flange.

Operating conditions:
These correspond to those of the sightglass used and it's rating.

Materials:
Contact parts: Stainless steel
Gaskets: PTFE

Possible combinations:
The spraying units may be used in conjunction with VETROLUX® wipers of the series W / WD or WS together with the lightfittings of the series CHEMLUX®, EdelLUX®, fibroLUX®, miniLUX® or metaLUX® without any restriction.

Connection:
The connection is made via a hole drilled into the welding flange, M14 x 1,5. A clearance hole of ø 21 mm in the cover flange is also required.

Remarks:
- Dependent on operating conditions, a suitable non-return valve should be built into the feed tube.
- When the spraying units are ordered **complete** with sightglasses, all the necessary fitting requirements will be carried out at our works, as part of the delivery.

Mounting and delivery contents:
The drawing left shows the elements of the delivery:
1 Connection piece
2 Gaskets
3 Counter nut
4 Spraying head

Ordering example:
A spraying unit for mounting into a sightglass to DIN 28120, DN 125: 1 piece SVS.

Important:
When the spraying unit is to be ordered together with a sightglass unit, we need the following information at the point of order:
1) Nominal diameter (DN), 2) nominal pressure (PN) of the sightglass, 3) materials for the welding and the cover flanges, 4) materials for the product and cover side gaskets, 5) quality of the glass disc (borosilicate / sodium silicate) and 6) material for the studs and nuts.

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Sightglass discs to DIN 7080
Sightglass discs to DIN 8902
Sightglass discs similar to DIN 7080 / 8902 with central bore hole ø 10.5 mm for wipers of the series W / WD

Sightglass discs to DIN 8902 or DIN 7080.

Sightglass discs similar to DIN 8902 or DIN 7080 with central bore hole ø 10,5 mm to fit our wipers of the series W/ WD.

Branch office / exclusive agent:

Application:
The sightglass discs are sized for mounting into the standard circular sightglasses to DIN 28120 / 218121 or similar and also for use in screwed sightglasses similar to DIN 11851. (So called “sanitary” or “dairy” version). The glass discs with central bore hole ø 10.5 mm have the same application as the above, but may be fitted with our centrally operated wipers of the series W / WD.

Operating conditions:
Nominal pressure: See tables below
Temperatures: Maximum 150 °C for sodium silicate glass to DIN 8902
Maximum 280 °C for borosilicate glass to DIN 7080
No minimum temperature limit
The glass discs are toughened by thermal treatment. The seal and viewing areas are polished. The edges are ground smooth.

Options:
- Individual pressure tests
- Special dimensions
- Double or compound glazing using discs of similar or different diameters as in table below from one piece
- Certificates to DIN EN 10204 may be supplied against extra charge

Plain version – no central bore hole

Diameter x thickness (mm)	Free view max. (mm)	Nominal pressure (bar)
45 x 10	32	40
45 x 12	32	50
50 x 10	35	25
50 x 12	35	40
60 x 10	45	16
60 x 12	45	25
60 x 15	45	40
63 x 10	48	16
63 x 12	48	25
63 x 15	48	40
80 x 12	65	16
80 x 15	65	25
80 x 20	65	40
100 x 15	80	16
100 x 20	80	25
100 x 25	80	40
125 x 15	100	10
125 x 20	100	16
125 x 25	100	25
135 x 25	110	25
150 x 20	125	10
150 x 25	125	16
150 x 30	125	25
175 x 20	150	10
175 x 25	150	16
175 x 30	150	25
200 x 20	175	8
200 x 25	175	10
200 x 30	175	16
250 x 25	225	8
250 x 30	225	10
265 x 30	240	8

Version with central bore hole ø 10.5 mm

Diameter x thickness (mm)	Free view max. (mm)	Nominal pressure (bar)
84 x 10	65	4
99 x 15	80	6
114 x 15	100	5
125 x 15	100	4.5
147 x 15	125	3
150 x 15	125	3
175 x 15	150	3
200 x 15	175	2
225 x 15	205	2
250 x 15	225	2

Plain version – no central bore hole for screwed sightglasses similar to DIN 11851

Diameter x thickness (mm)	Free view max. (mm)	Nominal pressure (bar)
66 x 8	50	6
84 x 10	65	6
99 x 10	80	6
114 x 12	100	6
147 x 15	125	6
175 x 15	150	6

All dimensions in mm. Subject to changes without preliminary notice.

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09.10

Flow indicators for pipelines with flanged ends for bolting Series FF-VA / FB-VA in stainless steel Series F-St in carbon steel

Sight flow indicator, series FB-VA, type FB-VA 50

Sight flow indicator, series FB-VA, type FB-VA 100

Application:
VETROLUX® sight flow indicators are used for the observation of a flow of liquid in tubes and pipelines. Visibility may be considerably enhanced by combination with our proven light fittings for hazardous and safe areas. (Please see our respective leaflets).

Operating conditions:

Nominal pressure:	10 bar (PN 10)
PN 6 / 16:	On request (only for series F-St)
Vacuum	
Maximum temperature:	280 °C

Standard materials:

Body material: (series FF-VA / FB-VA)	1.4435 (= AISI 316 L) / 1.4404 (= AISI 316 L) (up to DN 100) 1.4571 (= AISI 316 Ti) (from DN 125)
Loose connecting flanges, PN 10, to DIN 2642: (series FB-VA)	Galvanised RSt 37-2
Body material and welded connecting flanges to DIN 2576, PN 10: (Series F-St)	Carbon steel RSt 37-2
Flanges, PN 10 (to DIN 2576): (series FF-VA)	1.4571 (= AISI 316 Ti)
Cover flanges:	Galvanised RSt 37-2 / C 22.8 (FB-VA / F-St) Stainless steel (FF-VA)
Bolts:	Galvanised socket head screws to DIN 912, 8.8 (FB-VA / F-St) A4-70 (FF-VA)
Glass discs:	Borosilicate glass to DIN 7080 (Standard) Sodium silicate glass to DIN 8902 (Option)
Gaskets product side:	Graphite
cover side:	KLINGERsil C4400

Other materials are available on request.

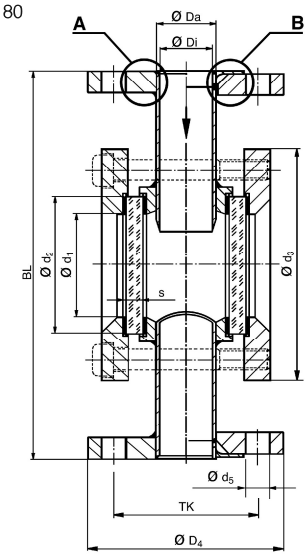
Options:
- Security version with double glazing
- Version **without** “drop-nose” for hygienic applications
- With turbine
- With flap

Remarks:
When enquiring or ordering please **always** state the nominal pressure (PN) required.

Ordering example:
1 piece VETROLUX® sight flow indicator with flanged ends, body in stainless steel 1.4435 (= AISI 316 L), nominal pressure 10 bar (PN 10), nominal diameter (DN) 80:
1 piece FF-VA 80-316 L-10-Graphite-KLINGERsil C4400

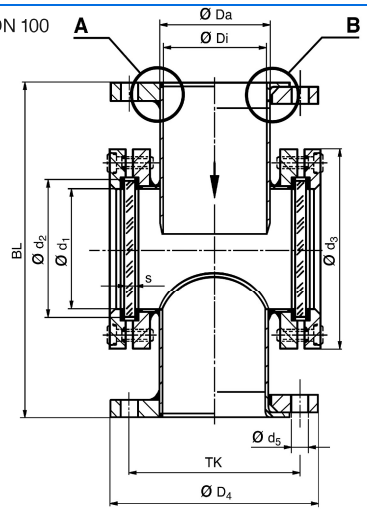
Type selection table
Dimensions

DN 15 - 80



A = Version F-St / FF-VA
B = Version FB-VA

From DN 100



A = Version F-St / FF-VA
B = Version FB-VA

Type	DN	BL (DIN F1)	ø D_4	TK	ø d_5	ø Da	ø Di	ø d_3	ø d_1	number and size of bolts	ø d_2	s
FF-VA FB-VA 15	15	130	95	65	14	21,3	18,1	110	32	4 x M8	45	10
F-St 15							16,0					
FF-VA FB-VA 20	20	150	105	75	14	26,9	23,7	110	48	4 x M10	63	10
F-St 20							21,6					
FF-VA FB-VA 25	25	160	115	85	14	33,7	29,7	135	48	4 x M10	63	10
F-St 25							27,2					
FF-VA FB-VA 32	32	180	140	100	18	42,4	38,4	135	65	4 x M10	80	12
F-St 32							35,9					
FF-VA FB-VA 40	40	200	150	110	18	48,3	44,3	135	65	4 x M12	80	12
F-St 40							41,8					
FF-VA FB-VA 50	50	230	165	125	18	60,3	55,1	150	80	4 x M12	100	15
F-St 50							53,0					
FF-VA FB-VA 65	65	290	185	145	18	76,1	70,9	150	80	4 x M12	100	15
F-St 65							70,3					
FF-VA FB-VA 80	80	310	200	160	18	88,9	83,7	185	100	4 x M12	125	15
F-St 80							82,5					
FF-VA FB-VA 100	100	350	220	180	18	114,3	107,9	210	125	8 x M12	150	20
F-St 100							107,1					
FF-VA FB-VA 125	125	400	250	210	18	139,7	133,3	240	150	8 x M12	175	20
F-St 125							131,7					
FF-VA FB-VA 150	150	480	285	240	22	168,3	161,9	275	175	8 x M16	200	25
F-St 150							159,3					
FF-VA FB-VA 200	200	600	340	295	22	219,1	212,7	340	225	8 x M16	250	30
F-St 200							207,3					

Branch office / exclusive agent:

Do you wish for more information about our wide range of light fittings for use in hazardous or safe areas, about our range of circular sightglasses to DIN 28120/28121, screwed sightglasses similar to DIN 11851, rectangular or D-ended sightglasses, pipeline flow indicators, sideways or centrally operated wipers, hinged sightglasses, spraying devices or our complete sight and light-glass units VETROLUX®? Are you interested in other types, special versions or different protection degrees? If yes, please contact us, our branch office or our local agents – it is our business! You will find the necessary indications about our sales network on the Internet.

All dimensions in mm. Subject to changes without preliminary notice.

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05.04

Flow indicators for pipelines
with ends for welding
Series S-VA in stainless steel
Series S-St in carbon steel

Sight flow indicator, series S-VA, type S-VA 80

Application:
VETROLUX® sight flow indicators, series S-VA / S-St with the new DIN lengthes, are used for the observation of a flow of liquid in tubes and pipelines. Visibility may be considerably enhanced by combination with our proven light fittings for hazardous and safe areas. (Please see our respective leaflets.)

Operating conditions:

Nominal pressure:	10 bar (PN 10)
	16 bar (PN 16) on request
Vacuum	
Maximum temperature:	280 °C (with borosilicate glass discs)
	150 °C (with sodium silicate glass discs)

Standard materials:

Body material:	Series S-VA:	1.4571 (= AISI 316 Ti)
	Series S-St:	Carbon steel RSt 37-2
Cover flanges:	Series S-VA:	Stainless steel
	Series S-St:	Carbon steel RSt 37-2
Socket head screws:	Series S-VA:	A4-70
	Series S-St:	Zinked 5.6
Glass discs:	Borosilicate glass to DIN 7080 (Standard)	
	Sodium silicate glass to DIN 8902 (Option)	
Gaskets product side:	Graphite	
cover side:	KLINGERsil C4400	

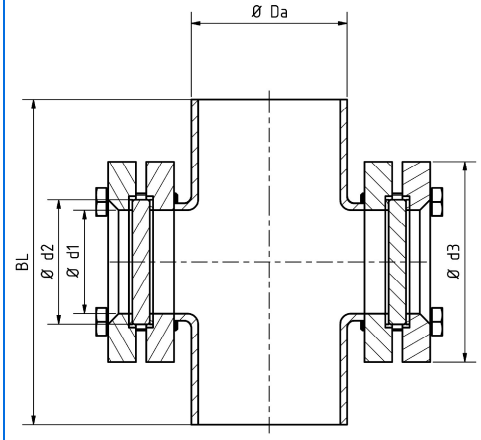
Other materials are available on request.

Options:
- Security version with double glazing

Remarks:
When enquiring or ordering please **always** state the nominal pressure (PN) required.

Ordering example:
1 piece VETROLUX® sight flow indicator for welding into position, body in stainless steel 1.4571 (= AISI 316 Ti), nominal pressure 10 bar (PN 10), nominal diameter DN 25:
1 piece S-VA 25-316 Ti-10-Graphite-KLINGERsil C4400

Type selection table
Dimensions



Typ	DN	BL	ø Da	ø d_3	ø d_1	Number and size of bolts	ø d_2	s
S-VA 25	25	160	33,7	□ 70	23	4 x M10	45	10
S-St 25								
S-VA 40	40	200	48,3	□ 85	39	4 x M12	63	10
S-St 40								
S-VA 50	50	230	60,3	□ 85	44	4 x M12	63	10
S-St 50								
S-VA 80	80	310	88,9	135	64	4 x M12	80	12
S-St 80								
S-VA 100	100	350	114,3	150	80	4 x M12	100	15
S-St 100								
S-VA 125	125	400	139,7	150	80	4 x M12	100	15
S-St 125								
S-VA 150	150	480	168,3	190	100	4 x M16	125	20
S-St 150								
S-VA 200	200	600	219,1	210	125	8 x M16	150	25
S-St 200								
S-VA 250	250	730	273,0	235	150	8 x M16	175	25
S-St 250								
S-VA 300	300	850	323,3	235	150	8 x M16	175	25
S-St 300								

Branch office / exclusive agent:

Do you wish for more information about our wide range of light fittings for use in hazardous or safe areas, about our range of circular sightglasses to DIN 28120/28121, screwed sightglasses similar to DIN 11851, rectangular or D-ended sightglasses, pipeline flow indicators, sideways or centrally operated wipers, hinged sightglasses, spraying devices, camera systems for hazardous areas or our complete sight and light-glass units VETROLUX®? Are you interested in other types, special versions or different protection degrees? If yes, please contact us, our branch office or our local agents – it is our business! You will find the necessary indications about our sales network on the Internet.

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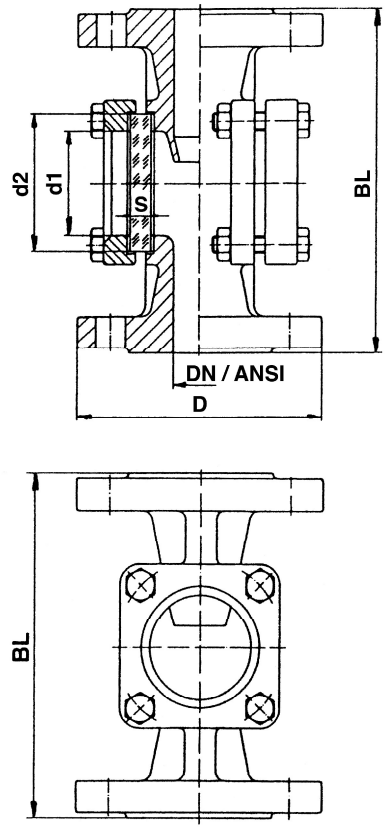
09.10

Flow indicators for pipelines
with flanged ends for bolting to DIN and ANSI
Series FDG in grey cast
Series FDS in steel cast
Series FDE in stainless steel

Sight flow indicator, type FDE 50, with sightglass light fitting type FKEL 5 dH WM, Ex d IIC T6, Ex tD A21 IP65 T80°C, Ex II 2 G + D, 230 V, 5 W, with opal glass screen «M»



Application:
VETROLUX® sight flow indicators are used for the observation of a flow of liquid in tubes and pipelines. The serially built-in drop-nose makes smallest flow rates visible. Visibility may be considerably enhanced by combination with our proven light fittings for hazardous and safe areas. (Please see our respective leaflets).

Operating conditions:

Nominal pressure:	PN 16 / 25 / 40 / PN 16 at 150 lbs / PN 40 at 300 lbs
Vacuum	
Maximum temperature:	280 °C (150 °C with sodium silicate glass)

Standard materials:

Body material:	Series FDG:	GG 25 (max. PN 16 / 150 lbs)
	Series FDS:	GS-C 25
	Series FDE:	Stainless steel 1.4408
Cover flanges:	Series FDG:	GG 25 / RSt 37-2 (max. PN 16 / 150 lbs)
	Series FDS:	GS-C 25 / RSt 37-2
	Series FDE:	Stainless steel 1.4408 / 1.4301
Bolts:	Series FDG / FDS:	4.6 / 5.6, zinked
	Series FDE:	A4-70
Glass discs:	Borosilicate glass to DIN 7080 (Standard)	
	Sodium silicate glass to DIN 8902 (Option)	
Gaskets product side:	Graphite	
cover side:	KLINGERsil C4400	

Other materials are available on request.

Mounting position:
Withour restriction. The flux direction has to be taken into account.

Certificates:
To be supplied to DIN EN 10204 against extra charge.

Options:
- With flap
- With welding ends
- With sightglass light fittings
- With turbine
- With heating jacket

Ordering example:
1 piece VETROLUX® sight flow indicator with flanged ends, body in stainless steel 1.4408, nominal pressure 16 bar (PN 16), nominal diameter (DN) 80:
1 piece FDE 80-1.4408-16-Graphite-KLINGERsil C4400

Dimensions:

DN	ANSI	D			BL	d1	d2	S		
		DIN	ANSI 150 lbs	ANSI 300 lbs				16 bar / 150 lbs	25 bar	40 bar / 300 lbs
15	½"	95	89	95,2	130	32	45	10	10	10
20	¾"	105	98	117,3	150	32	45	10	10	10
25	1"	115	108	123,8	160	48	63	10	12	15
32	1¼"	140	118	133,4	180	48	63 [3]	10	12	15
40	1½"	150	127	155,6	200	65	80	12	15	20
50	2"	165	152	165,1	230	80	100	15	20	25
65	2½"	185	178	190,5	290	80	100	15	20	25
80	3"	200	191	209,6	310	100	125	20	25	30
100	4"	220 (235) [1]	228 [2]	254,0	350	125	150	25	30	35
125	5"	250 (270) [1]	254 [2]	279,4	400	150	175	25	30	40
150	6"	285 (300) [1]	279	317,5	480	175	200	30 [4]	35	50
200	8"	340 (360/375) [1]	343 [2]	381,0	600	175	200	30 [4]	35	50

[1] D in ( ) corresponding to PN 25 / 40 [2] Not deliverable in GG 25 [3] Glass dimension in GG 25: ø 80x12
[4] Only with glass discs from borosilicate to DIN 7080

All dimensions in mm. Subject to changes without preliminary notice.

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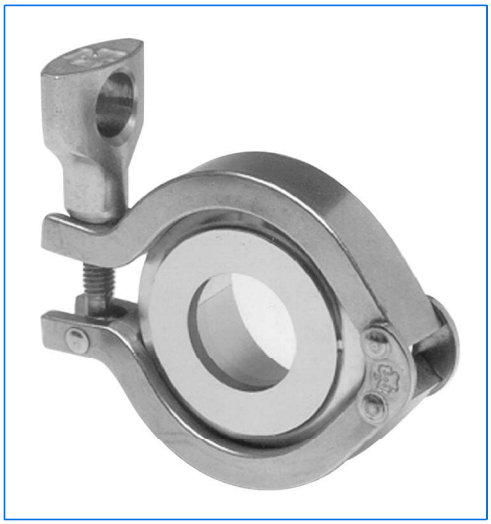
03.11

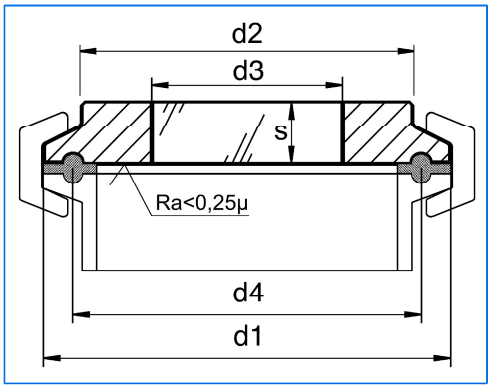
VETRO MM LUX ®

Metal fused sightglasses
for Triclamp fittings



Metal fused Triclamp sanitary sightglass fitting, type "Standard View" (SV)

Metal fused Triclamp sanitary sightglass fitting, type "Large View" (LV)



Typical assembly

All dimensions in mm. Subject to changes without preliminary notice.

Applications:
For clamp fittings to DIN 32676 / ISO 2852

Versions:
- Version with standard view, type "Standard View" (SV)
- Version **with enlarged view**, type "Large View" (LV)

Advantages:
- Suitable for food processing and sterile applications
- High security
- Easy installation

Technical data:
- Test base: DGRL 97 / 23 / EG, AD 2000 standards, DIN 7079-1 May 1999
- Materials to VdTÜV specifications and the respective DIN/EN standards

Certificates:
To be supplied to DIN EN 10204-3.1 against extra charge

Operating conditions:
- Pressure: –1 to 6 / 10 / 16 / 25 bar (see table)
- Temperatures:

Ring materials:	1.4462:	- 30 °C to + 280 °C (SV) / +150 °C (LV)
	2.4602:	- 60 °C to + 300 °C (SV) / +150 °C (LV)
	2.4610:	- 60 °C to + 300 °C (type SV only)

Materials:

• Ring:	1.4462, 2.4602, 2.4610 (SV) / 1.4462, 2.4602 (LV)
• Glass quality:	Borosilicate to DIN 7080 (SV)
	Sodium silicate to DIN 8901 (quality B270 Superwite) (LV)

Dimensions:

Nominal diameter			d1	d2		d3		d4	S		Max. operating pressure (bar)
DN to DIN	DN to ISO	ASME-BPE Inch		SV	LV	SV	LV		SV	LV	
-	-	½"/¾"	25	18	-	10	-	20,5	10	-	25
10/15/20	8/10/15	-	34	21	-	14	-	27,5	8	-	25
25/32/40	20/25/32	1"/1½"	50,5	41	42,5	25	30	43,5	10	10	16
50	40	2"	64	52	55,6	30	37	56,5	10	12	16
-	50	2½"	77,5	69	69	35	45	70,5	10	14	16
65	65	3"	91	76	82,4	40	55	83,5	10	14	10
80	80	3½"	106	90	90	50	60	97	10	15	10
100	-	4"	119	101	108	55	75	110	12	18	10
-	100	4½"	130	114	-	60	-	122	16	-	10
-	-	5"	144,5	127	-	65	-	134,5	16	-	10
125	-	-	155	138	-	70	-	146	16	-	6
-	-	6"	167	152	152	75	105	156,5	16	22	6
150	-	-	183	160	-	80	-	174,3	16	-	6
-	-	8"	217,5	198	203	100	130	207,4	18	24	6
200	-	-	233,5	210	-	100	-	255,1	18	-	6
-	-	10"	268	245	245	120	160	257,8	20	25	6
250	-	-	287,5	266	-	120	-	278,4	20	-	6
-	-	12"	319,3	300	300	140	200	309,1	22	30	6
300	-	-	338,3	316	-	140	-	328,4	22	-	6

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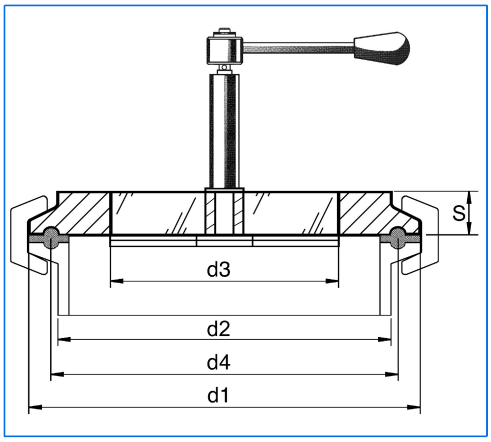
01.12

Metal fused sightglasses with wipers series WD for Triclamp fittings

Sightglass for Triclamp fitting with built-in wiper, series WD



Typical assembly

Branch office / exclusive agent:

Application:
- For clamp fittings to DIN 32676 / ISO 2852

Advantages:
- For sterile applications
- High security
- Easy installation

Technical data:
- Test base: DGRL 97 / 23 / EG, AD 2000 standards, DIN 7079-1 May 1999
- Ring materials to VdTÜV specifications and the respective DIN / EN standards

Certificates:
- To be supplied against extra charge to DIN EN 10204-3.1

Operating conditions:
- Pressure: –1 to 6 bar
- Temperature: Maximum 150°C

Materials:

Ring:	1.4462, 2.4602 (other materials on demand)
Fused bush:	1.3912 (Alloy 36)
Glass disc:	Borosilicate glass to DIN 7080
Wiper:	
Wiper blade:	PTFE or silicone rubber
Mechanical parts:	Stainless steel (contact parts)
O-rings:	Viton
Operated by:	Handling arm with free-wheel return drive

Dimensions:

Nominal diameter (DN)		d1	d2	d3	d4	S	Max. operating pressure (bar)
(mm)	(inch)						
65 *	3"	91	76	40	83,5	10	6
80 *	3½"	106	90	50	97	10	6
100 *	4"	119	101	55	110	12	6
-	6"	167	152	75	156,5	16	6
150	-	183	160	75	174,3	16	6
-	8"	217,5	198	100	207,4	18	6
200	-	233,5	210	100	225,1	18	6
-	10"	268	245	120	257,8	20	6
250	-	287,5	266	120	278,4	20	6
-	12"	319,3	300	140	309,1	22	6
300	-	338,3	316	140	328,4	22	6

* Not recommended since extremely little viewing surface

All dimensions in mm. Subject to changes without preliminary notice.

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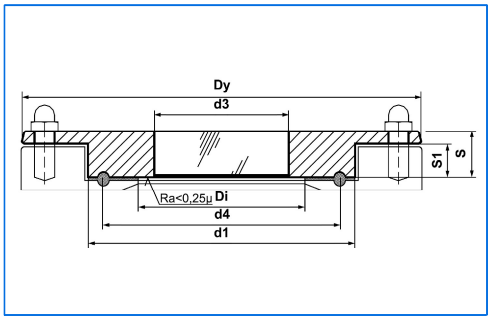
03.11

Metal fused sightglasses for NA-Connect™-connections

NA-Connect™ sightglass



Typical assembly

Branch office / exclusive agent:

Application:
For NA-Connect™- connections

Advantages:
- Extremely compact construction
- High security
- Easy installation
- For sterile applications
- CIP cleaning possible

Technical data:
- Test base: DGRL 97 / 23 / EG, AD 2000 standards, DIN 7079-1 May 1999
- Materials to VdTÜV specifications and the respective DIN/EN standards
- Glass quality: Borosilicate glass to DIN 7080

Certificates:
- To be supplied against extra charge to DIN EN 10204

Operating conditions:
- Temperatures:

Ring materials:	1.4462:	-30 °C to +280 °C
	2.4602:	-60 °C to +300 °C
	2.4610:	-60 °C to +300 °C

NA-Connect™:

Materials welding flange:	316 L / 1.4435
Nominal pressure:	7 bar (PN 7)
Nominal temperature:	150 °C

Dimensions:

Nominal diameter		NA-Connect-welding flange		d1	d3	d4	S1	S	Dy	Di
(inch)	(mm)	DIN	Tube OD							
½" / ¾"	-	-	NAC-OD-¾"	25,0	13	20,2	6	11	55	15,0
-	10 / 15 / 20	NAC-DIN-20	-	34,0	18	27,5	6	11	70	20,0
1" / 1½"	25 / 32 / 40	NAC-DIN-40	NAC-OD-1½"	50,5	30	43,5	7	13	85	35,5
2"	50	NAC-DIN-50	NAC-OD-2"	64,0	35	56,5	8	14	100	48,5
2½"	-	-	NAC-OD-2½"	77,5	40	69,0	8	17	112	60,2
3"	65	NAC-DIN-65	NAC-OD-3"	91,0	45	83,5	8	18	131	72,0
3½"	80	NAC-DIN-80		106,0	60	97,0	8	18	146	84,9
4"	100	NAC-DIN-100	NAC-OD-4"	119,0	65	110	8	18	170	97,6

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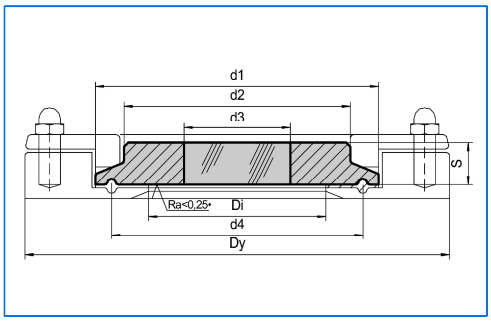
02.11

Metal fused METACLAMP® sight-glasses for NA-Connect™-connections

NA-Connect™ sightglass



Typical assembly

Branch office / exclusive agent:

Application:
For NA-Connect™- connections with connection sizes to DIN 32 676 / ISO 2852

Advantages:
- Extremely compact construction
- High security
- Easy installation
- For sterile applications
- CIP cleaning possible

Technical data of METACLAMP® sightglasses:
- Test base: DGRL 97 / 23 / EG, AD 2000 standards, DIN 7079-1 May 1999
- Materials to VdTÜV specifications and the respective DIN/EN standards
- Glass quality: Borosilicate glass to DIN 7080

Certificates:
To be supplied to DIN EN 10204-3.1 against extra charge

Operating conditions:
Temperatures:

Ring materials:	1.4462:	-30 °C to +280 °C
	2.4602:	-60 °C to +300 °C
	2.4610:	-60 °C to +300 °C

Technical data of NA-Connect™ system:
- Materials welding flange: 316 L / 1.4435
- Materials holding ring: 316 L / 1.4404

} Not contained in our delivery

- Nominal pressure: 7 bar (PN 7)
- Nominal temperature: 150 °C

Homologations:
ASME BPE 2005

Dimensions:

Nominal diameter		PN	d1	d2	d3	d4	S	Dy	Di
DIN	Tube OD								
NAC-DIN-20	-	16	34,0	18,0	10	27,5	7	70	20,0
NAC-DIN-40	(NAC-OD-1½")	16	50,5	38,0	25	43,5	10	85	35,5
NAC-DIN-50	(NAC-OD-2")	16	64,0	51,0	30	56,5	10	100	48,5
-	(NAC-OD-2½")	16	77,5	63,5	35	70,5	10	112	60,2
NAC-DIN-65	(NAC-OD-3")	10	91,0	76,0	40	83,5	10	131	72,0
NAC-DIN-80	-	10	106,0	88,9	50	97,0	10	146	84,9
NAC-DIN-100	(NAC-OD-4")	10	119,0	101,0	55	110,0	12	170	97,6

All dimensions in mm. Subject to changes without preliminary notice.

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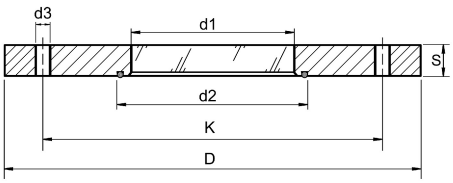
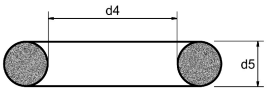
Metal fused sightglass flanges
for sterile applications

Sightglass flange DN 150



O-ring
AS 568 A / B.S. 1806



Typical assembly

Application:
- For base flanges to DIN 28117 or similar
- For weldnecks with flat face

IMPORTANT: Only for use with parallel flat face flanges without seal recess. Maximum tightening torque 20 Nm. We therefore recommend the use of Belleville spring washers, 2 pcs. for each connection hole.

Advantages:
- High security
- Flush glass / metal border on outer side for easy cleaning for sterile applications
- Maximum viewing area

Approvals:
TÜV-Approval to the pressure vessel guideline as part of a pressure vessel (for material duplex stainless steel 1.4462)

Technical data:
- Test base: DGRL 97 / 23 / EG, AD 2000 standards, DIN 7079-1 May 1999
- Materials to VdTÜV specifications and the respective DIN / EN standards
- Glass quality: Borosilicate glass to DIN 7080

Certificates:
- To be supplied against extra charge to DIN EN 10204

- Pressure: –1 to 16 bar (see table)
- Temperatures:

Ring materials:	1.4462:	- 30 °C to + 280 °C
	2.4602	- 60 °C to + 300 °C
	2.4605	- 60 °C to + 300 °C
	2.4610	- 60 °C to + 300 °C

Dimensions:

DN	PN	D	K	S	d1	d2	d3	Number of holes	O-Ring* d4 x d5	Spring washers*
50	16	165	125	21	50	66	18	4	58,74 x 3,53	31,5/16,3x1,25
65	16	185	145	23	70	86	18	4	78,97 x 3,53	31,5/16,3x1,25
80	16	200	160	23	80	96	18	8	88,50 x 3,53	31,5/16,3x1,25
100	16	220	180	23	90	116	18	8	107,5 x 3,53	31,5/16,3x1,25
125	16	250	210	25	110	141	18	8	132,9 x 3,53	31,5/16,3x1,25
150	16	285	240	28	130	165	22	8	158,34 x 3,53	40/20,4x1,5
200	10	340	295	30	140	208	22	8	202,8 x 3,53	40/20,4x1,5

* Not contained in our delivery

Branch office / exclusive agent:

All dimensions in mm. Subject to changes without preliminary notice.

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