



Optoelektronische Grenzwertgeber *Optoelectronic Level Switches*



720



ING. ROLF HEUN

Meß- Prüf- Regeltechnik GmbH

Hufeisen 16

21218 Seevetal / Hittfeld

Tel.: 04105-5723-0

Fax.: 04105-5723-66



Funktionsprinzip Optoelektronik

Die Füllstand-Grenzwertenerfassung mit der Kegelspitze ist weitestgehend unabhängig von physikalischen Eigenschaften der Flüssigkeiten wie Dichte, Dielektrizitätskonstante, Leitfähigkeit, Farbe und Brechzahl. Die Kennlinie im Diagramm Füllstand zeigt den Schaltübergang, der mit 1,1 in einem Bereich liegt, der weder von Gasen noch von Flüssigkeiten physikalisch erreicht werden kann (alle Gase haben eine Brechzahl $<1,05$ und alle Flüssigkeiten $>1,25$).

Die Trennschichtmessung dagegen nutzt die Brechzahl-Abhängigkeit der oben abgebildeten rundlichen Sensorspitze.

Functional Description Optoelectronics

Measuring Level limits with the conical tip is independent of physical properties such as density, dielectric constant, conductivity, colour and refractive index. The characteristic curve in the diagram level above shows the switching property. The transition always occurs in a region (1.1), which never can be reached by any liquid or gas (the refractive index of all gases is <1.05 and of all liquids >1.25).

The interface measurement makes use of the dependency of refractive index caused by the rounded sensor tip.

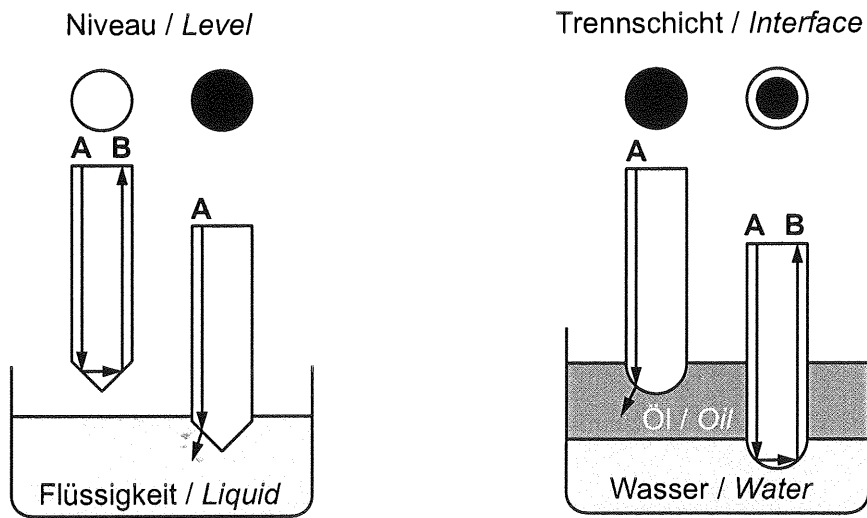
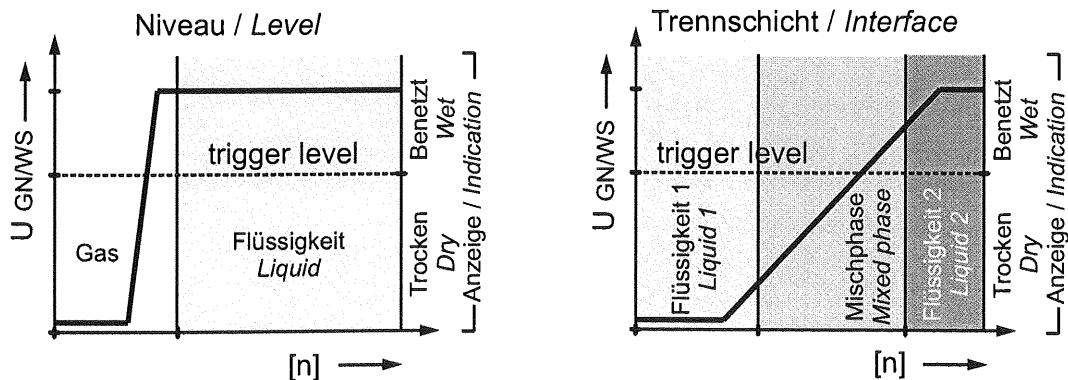
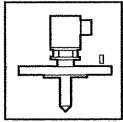


Diagramm / Diagram





Optoelectronic Level Switches

Product group **720**

Selection table

Type **-**

Sheet: 1/1 Revision: 6

Date: 1/07

Table Design Data

Type	Appli- cation		Temperature						Pressure	Ingr. prof. EN 60529	Material in contact with media							mech. connection																	
	Level	Interface	Media			Ambient					Material in contact with media							mech. connection																	
			-20 to +60 °C	-30 to +95 °C	-30 to +140 °C	-50/60 to +200/250 °C	-65/269/+250/400 °C**)	-20/25 to +60 °C *****)	-25 to +70 °C	-25 to +95 °C	-50 to +95 °C	-65 to +95 °C	0 - 0,5 MPa	0 - 1 MPa	0 - 3/5 MPa *****)	0 - 25/50 MPa **)	IP 65	IP 65/66 ***)	IP 65/67 ****)	Duran	Quartz	Cladded core glass	Sapphire	Graphite	PTFE	Stainless steel	Others (Hastelloy...)	Metr./Whitworth	Flange	Sterile flange	Glass installations				
720.0020-24	●					●													●																
720.002L	●				●											●								●								●			
720.0030/33/34	●						●																												
720.0032	●	●				●																													
720.0632	●	●	●					●																											
720.0042	●	●														●																			
720.0642	●	●																																	
720.06XX	●	●																																	

Table Electrical Data, Ex-classification

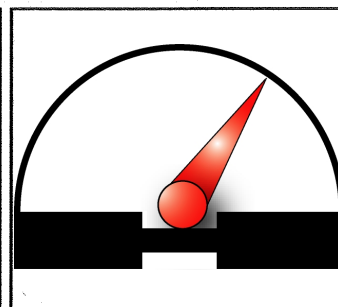
Type	Electr. version		Certificates		Output		Power supply				Switch		Features	Connection																							
	integr. switch electron. seperate switch amp. fail safe ****)		Ex i (ATEX/SEV) ****)	Zone 0	OPD WHG §19 ****)	SIL1 ****)	PNP, O.C.	SPDT signal	SPDT failure	24 V= (****)	24 V= isolated ****)	24 V~ ****)		230 V~ ****)	24 V=					250 V= / ~ ****)	0,5 A=	3 A= / ~	3 A= / ~, 100VA ****)	Connection													
													Switch direction fixed			H-L switch	Sensitivity adjustable	Adjustable time-lag	Cable 3x0,14 mm ²					Plug type series 713	Plug type series 680	Screw term. 2,5 mm ²											
720.0020-24/2L	●						●			●			●																								
720.0030/33	●																																				
720.0034	●																																				
720.0032		●	●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
720.0632		●	●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
720.0042		●	●					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
720.0642		●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
720.06XX		●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

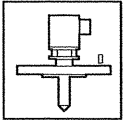
Notes

- *) with/without heatsink
- **) low-/high pressure type
- ***) plug-/cable connection
- ****) in combination with switch amplifier type 720.250X
- *****) 720.0632: -20...+60 °C, 30 bar

Remark:
OPD=Overfill prevention device (only for Germany)

subject to alterations





Mini Switch

Optoelectronic liquid Level limit switch
Threaded connection
integrated switched light circuit module
Output open-collector pnp transistor

Product group **720**

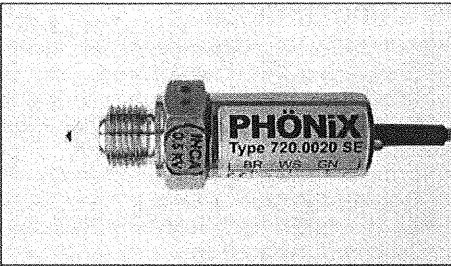
Type **0020/21/23**

Page: 1/1

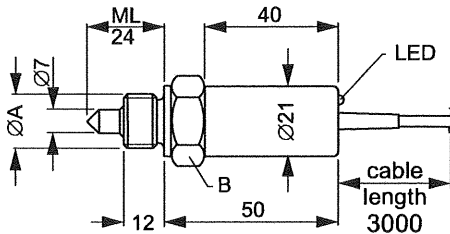
Revision: 6

Date:

4/06



Version
M16x1,5



This type can be delivered
in three versions:

Typ	ØA	B
720.0020SX	M16 x 1,5	SW24
720.0021SX	NPT 1/2"	SW24
720.0023SX	G1/2A	SW30

Cross reference:

New ordering no	Old ordering no
7200020SE	178 558
7200020SA	178 559
7200021SE	178 556
7200021SA	178 557
7200023SE	178 562
7200023SA	178 561

measures in mm

Field of application

This Optoelectronic limit switch is for signalling liquid level limits. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties like density, dielectric constant, conductivity or color. The very compact construction only needs a minimum of space and enables it also to measure very small volume levels. With its built in green LED the activated state is indicated. It can also be used in transparent tanks.

General Data

Measuring accuracy: +/-0,5 mm
Light source: IR-Light 930 nm
Ambient light: max. 10.000 Lux
Minimum distance
Sensor tip to any opposite wall: >10 mm
Mounting direction: any
Indication of active output: green LED
Switch direction: to be set at factory

Design Data

Operating temperature: -30 to +140 °C
Ambient temperature: -25 to +70 °C
Operating pressure: 0 - 5 MPa (0 - 50 bar)
Material Sensor-housing: SS
Material Light guide: Quartzglass
Material packing: PTFE
Material housing: SS
Weight: 0.15 kg

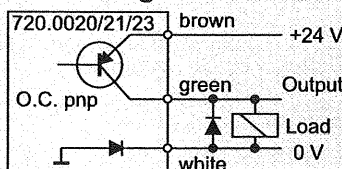
Electrical Data

Rated voltage: 24 V DC -25/+30 %
Supply current max.: 40 mA
Output: O.C. pnp-Transistor
current, voltage dissipation limited
short-circuit-protected

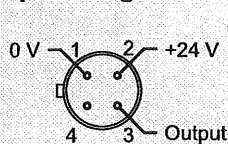
Switch current (Tu=70 °C): 0,5 A
Connection: PVC-cable 3*0.14 mm2
or plug 4-pole serie 713, M12
Ingress protection EN 60529 with plug: IP 65
With cable: IP 66

subject to alterations

Connection diagram



pin assignment



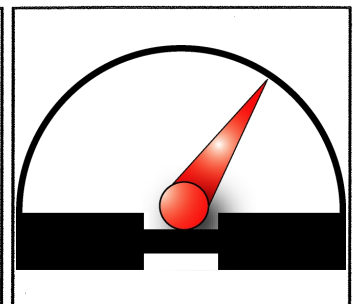
Ordering no.

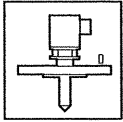
7 2 0 0 0 2 X S X - 5 9 _ _ _ X X X

Connection	M16x1,5	0	NPT 1/2"	1	G1/2A	3
Switch direction	switching immersed	E	switching dry	A		

B	Plug M12	Cable or plug type
P	PVC cable	
3	3 m	Cable length
5	5 m	

A	Cable shielded	electrical connection
K	Cable	
S	Plug	





Mini Switch

Compact Optoelectronic liquid Level limit switch with integrated alternating light circuit module. The switching function may be adapted for the application. The output configuration is an open-collector pnp-Transistor.

Product group **720**

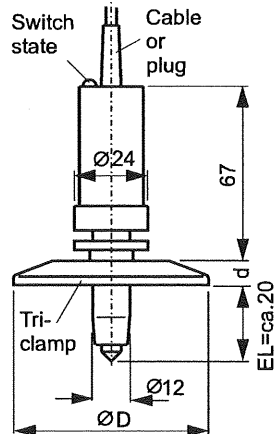
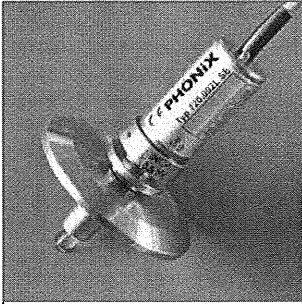
Type **002L**

Page: 1/1

Revision: 6

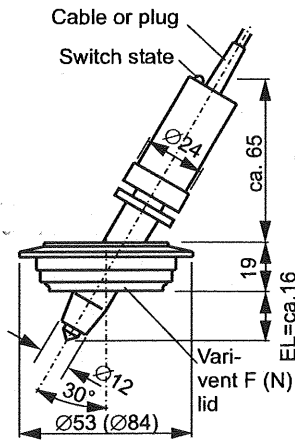
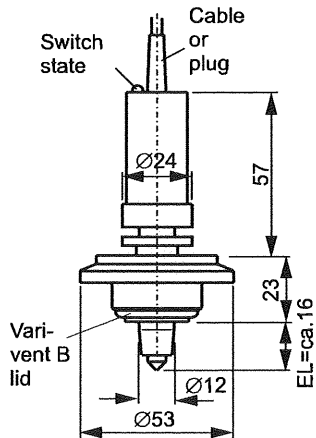
Date:

4/06



Measure table Tri-Clamp

Diameter	ØD	d
NW10/15	34,0	4,7
NW25/ISO32/NW40	50,5	6,4
2"/NW50	64,0	6,4
1 1/2"/ISO60,3/63,5	77,5	6,4



Measures in mm

Field of application

This Optoelectronic limit switch is for signalling liquid level limits especially in sterile areas. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties like density, dielectric constant, conductivity or color. The very compact construction only needs a minimum of space and enables it also to measure very small volume levels. With its built in green LED the activated state is indicated.

General Data

Measuring accuracy: $\pm 0,5$ mm
 Light source: IR-Light 930 nm
 Ambient light: max. 10.000 Lux
 Minimum distance sensor tip to any opposite wall (electropolished): >25 mm (depends very strongly on the nominal size of pipe and surface finish), or mount diagonally or mount in a pipe bend
 Mounting direction: any
 Indication of active output: green LED
 Switch logic: to be set by factory

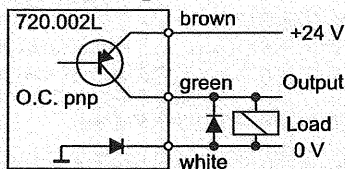
Design Data

Operating temperature: -30 to +140 °C
 Ambient temperature: -25 to +70 °C
 Sterilizing with steam: 15 min. at 150 °C
 Operating pressure: 0 - 2,5 MPa (0 - 25 bar)
 Material media affected: SS, see ordering no.
 Material Light guide: Quartzglass
 Material packing: PTFE
 Material housing: 1.4301
 Weight: 0.125 kg + weight of mechan.conn.

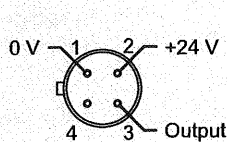
Electrical Data

Rated voltage: 24 V DC -25/+30 %
 Supply current max.: 40 mA
 Output: o. C. pnp-Transistor current, voltage dissipation limited short-circuit-protected
 Switch current ($T_u=70$ °C): 0,5 A
 Connection: PVC-cable 3*0.14 mm² or TEFLON-cable 3*0.24 mm² or plug 4-pole serie 713
 Ingress protection EN 60529 with plug: IP 65
 With cable: IP 66
 subject to alterations

Connection diagram

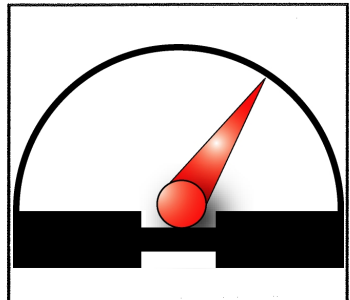


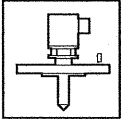
pin assignment



Ordering no.

720.002L-SX-XXXXXX		B Binder type 713	Cable, plug sort
		P PVC	
		T Teflon, high temp.resistant	
Switch direction	switching immersed E	3 3 m	Cable length
	switching dry A	5 5 m	
Material	1.4301	K Cable	electrical connection
	1.4401	S Plug	
	1.4435	0 90° vertical mounting position	mounting angle
Connection type	Tri-Clamp NW50	3 30° sloping mount. pos. (Varivent form F/N)	Connection form
	Varivent form B	1 NW 10/15 (not for Ingold and Tri-Clamp)	
	Varivent form F	2 NW25	
	Varivent form N	4 NW40	
	Ingold	5 NW50	
	Coupling for food acc. to DIN 11887	D G 1 1/4"	

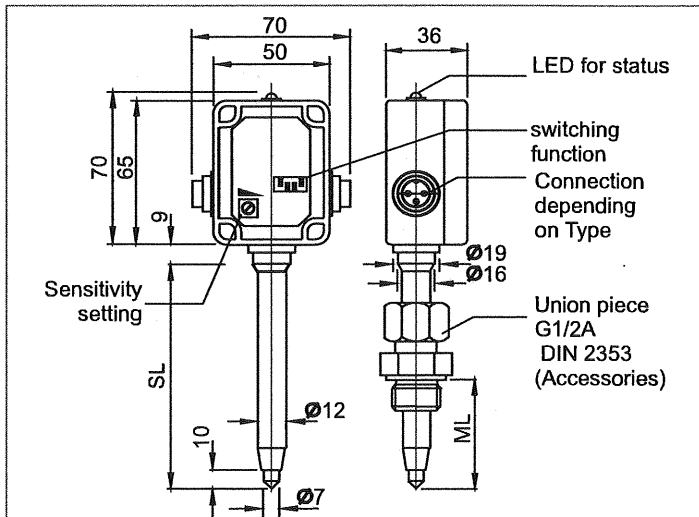




Compact Limit Switch

Optoelectronic liquid Level limit switch with integrated alternating light circuit module and relay. The switching function can be set with a switch as well as sensitivity for any application.

Product group	720	
Type	0030/33	
Page:	1/1	Revision: 4
Date:	4/06	



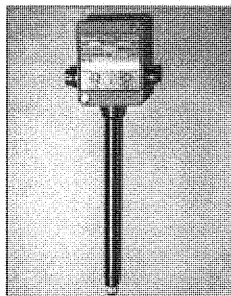
Field of application

This Optoelectronic limit switch is for signalling liquid level limits. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties like density, dielectric constant, conductivity or color. Even foam is no problem as sensitivity can be set. The very compact construction only needs a minimum of space for mounting and allows measuring lengths up to 2000 mm. It can also be used in transparent tanks. With its built in green LED the activated state of the relay is always indicated.

General Data

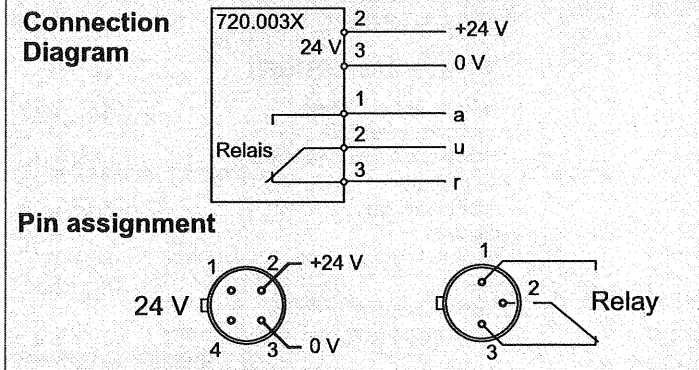
Measuring accuracy:	±0,5 mm
Light source:	IR-Light 930 nm
Ambient light:	max. 10.000 Lux
minimum distance	
sensor tip to any opposite wall:	>10 mm
Fitting position:	any
Indication of active state relay:	green LED
Switch logic:	reversible
Weight:	ML 18-49: 0.12 kg + 5 g/cm ML

Sensor length SL	Measuring length ML
100	18 - 49
250	18 - 200
550	18 - 500
1050	18 - 1000
2050	18 - 2000



Design Data

Operating temperature:	- 30 to +95 °C
Ambient temperature:	-25 to +60 °C
Operating pressure:	0 - 5 MPa (0 - 50 bar)
Material Sensor-housing:	1.4571
Material Light guider:	Quartzglass
Material packing:	PTFE
Material housing:	Makrolon



Electrical Data

Rated voltage:	24 V DC -25/+30 %
Supply current max.:	40 mA
Switch voltage/current:	250 V AC / 3 A
Stress cycles:	> 10 ⁷
Connection Relay-output:	Plug 3-pole serie 723
Connection power supply:	Plug 4-pole serie 723
Ingress protection EN 60529 completed:	IP 65

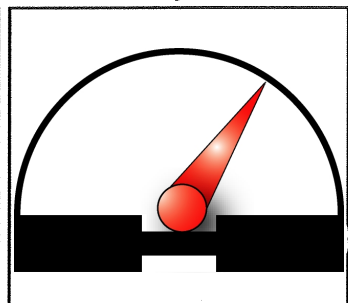
subject to alterations

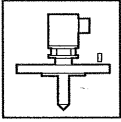
Ordering No.

7 2 0 . 1 1 0 3 1 7 X X X . 0 0 3 X - X

Sensor length	Sensor length in cm, e. g. 250 mm = 025	X X X
Output	Plug, standard-Relay	0
	Plug, fast-cycle-relay	3

N	Normal	Construct.
D	Differential, sensor displaced from electronic	





Compact Limit Switch

integrated alternating light circuit module
 relay output
 switching direction can be set with a switch
 adjustable sensitivity for any application

Product group **720**

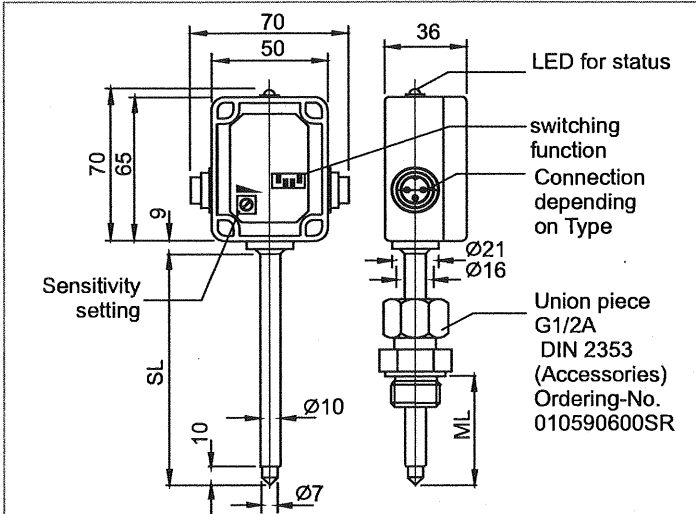
Type **0034**

Page: 1/1

Revision: 5

Date:

6/06



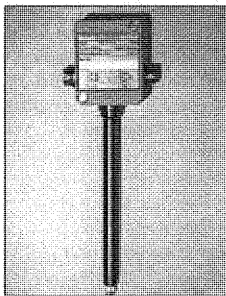
Field of application

This Optoelectronic limit switch is for signalling liquid level limits. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties like density, dielectric constant, conductivity or color. Even foam is no problem as sensitivity can be set. The very compact construction only needs a minimum of space for mounting and allows measuring lengths up to 2000 mm. It can also be used in transparent tanks. With its built in green LED the activated state of the relay is always indicated.

General Data

Measuring accuracy: ±0,5 mm
 Light source: IR-Light 930 nm
 Ambient light: max. 10.000 Lux
 minimum distance
 sensor tip to any opposite wall: >10 mm
 Fitting position: any
 Indication of active state relay: green LED
 Switch logic: reversible
 Weight: ML 18-49: 0.12 kg + 5 g/cm ML

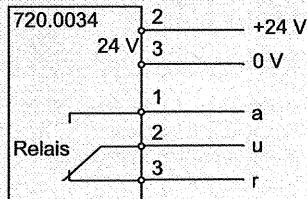
Sensor length SL	Measuring length ML
100	18 - 49
250	18 - 200
550	18 - 500
1050	18 - 1000
2050	18 - 2000



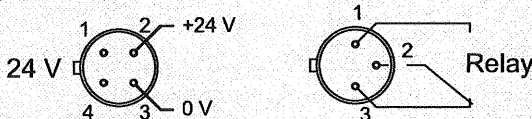
Design Data

Operating temperature: - 30 to+95 °C
 Ambient temperature: -25 to+60 °C
 Operating pressure: 0 - 5 MPa (0 - 50 bar)
 Material Sensor-housing: 1.4571
 Material Light guider: Quartzglass
 Material packing: Graphite, PTFE
 Material housing: Makrolon

Connection Diagram



Pin assignment



Electrical Data

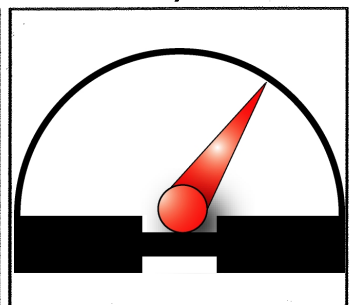
Rated voltage: 24 V DC -25/+30 %
 Supply current max.: 40 mA
 Switch voltage/current: 250 V AC / 3 A
 Stress cycles: > 10⁷
 Connection Relay-output: Plug 3-pole serie 723
 Connection power supply: Plug 4-pole serie 723
 Ingress protection EN 60529 completed: IP 65

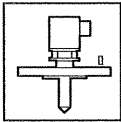
subject to alterations

Ordering No.

7 2 0 . 1 1 0 3 1 7 X X X . 0 0 3 4 - X X

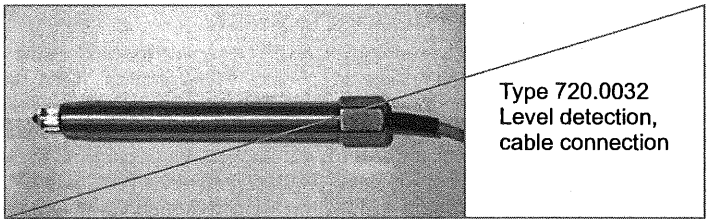
Sensor length	Sensor length in cm, e. g. 250 mm = 025	X X X	N Normal	Construct
Version	Plug, standard-Relay	-	T higher Temp.	
	Plug, fast-cycle-relay	G	D Differential	





Transducer
Optoelectronic liquid level limit sensor one-piece design

Product group	720		
Type	0032		
Sheet:	1/1	Revision:	3
Date:	4/05		



Type 720.0032
Level detection,
cable connection

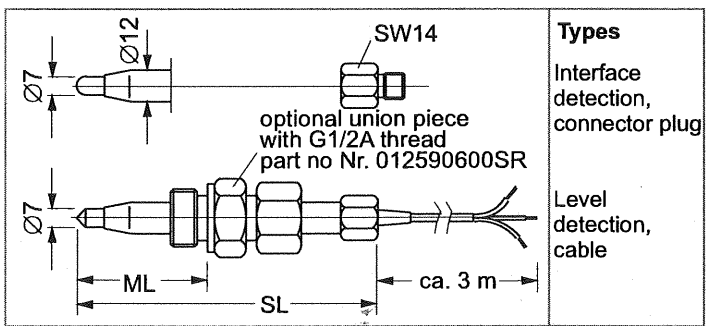
Field of application

This Optoelectronic limit sensor is for signalling liquid level and interface limits. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties like density, dielectric constant, conductivity or color. The very compact construction only needs a minimum of space and enables it to measure in very small volumes. It also can be built into pH-electrode connections

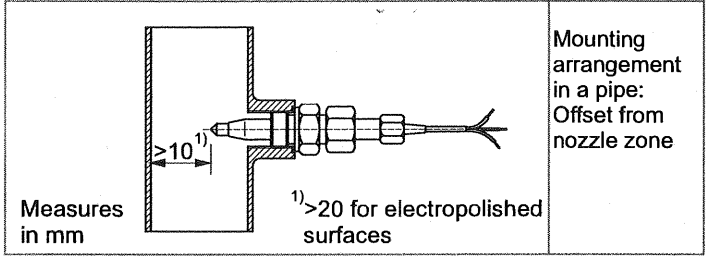
SL	ML	Stock no.	
		Level	Interface
100	18 - 49	7200032L010	7200032I010
150	18 - 100	7200032L015	7200032I015
250	18 - 200	7200032L025	7200032I025
550	18 - 500	7200032L055	7200032I055
1050	18-1000	7200032L105	7200032I105

General Data

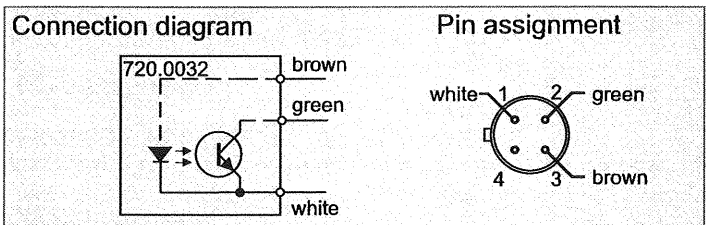
Accuracy:	±0,5 mm
Minimum difference in refractive index for interface detection:	0,01 R.I.
Light source:	IR-light 930 nm
minimum distance between Sensor tip and any opposite surface:	>10 mm
Installation orientation:	any
Controller:	Type 720.0250



Types
Interface detection, connector plug
Level detection, cable



Mounting arrangement in a pipe:
Offset from nozzle zone



Design Data

Operating temperature:	- 30 to +95 °C
Ambient temperature:	-25 to +95 °C
Operating pressure:	0 - 5 MPa (0 - 50 bar)
Material Sensor-housing:	1.4571
Material light guide:	Quartz glass
Material packing:	Graphite
Weight:	0,1 kg
	+5 g/cm elongation

Electrical Data

Supply, output:	see Controller Type 720.0250
Connection:	PVC-cable 3*0,14 mm2 or plug 4-pole serie 713
Ingress protection EN 60529 with plug:	IP 65
with cable:	IP 67

Accessories

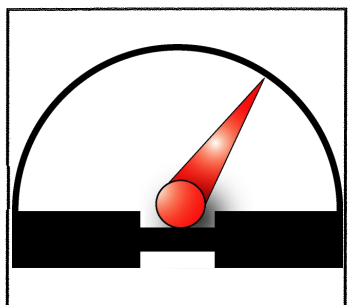
Union piece DIN 2353 G1/2A	012590600SR
Female plug for connector plug	STK4713M12

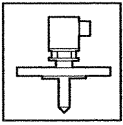
Subject to alterations

Ordering no.

7 2 0 . 0 0 3 2 X X X X - X

Measure	Interface	I	Sensor length SL [cm]
	Level	L	
		0 1 0	100 mm
		0 1 5	150 mm
		0 2 5	250 mm
		0 5 5	550 mm
		1 0 5	1050 mm





Transducer

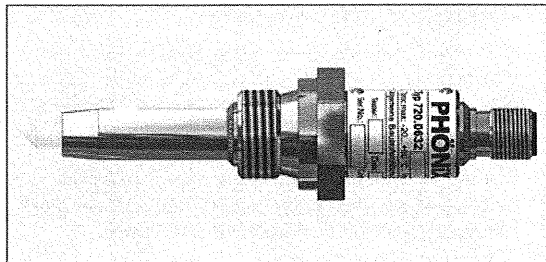
Optoelectronic liquid level limit sensor one-piece design
Overfill prevention device acc. to WHG§19

Product group **720**

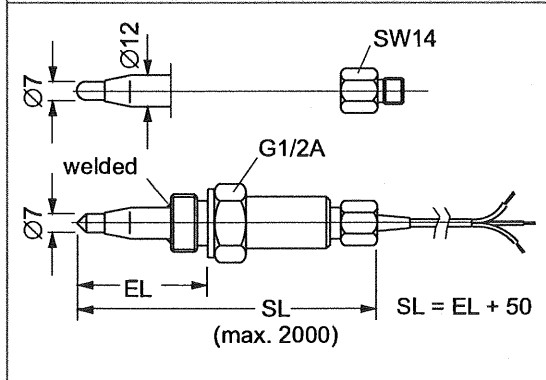
Type **0632**

Sheet: 1/1 Revision: 3

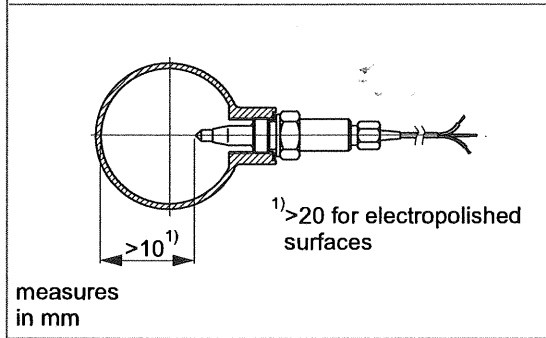
Date: 1/07



Example
Level
detection
and
plug
connection



Types
Level
or
interface
detection,
plug
or
cable
connection



Mounting
arrangement
in a pipe:
offset from
nozzle zone

Field of application

This Optoelectronic limit sensor is for signalling liquid level and interface limits. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties like density, dielectric constant, conductivity or color. The very compact construction only needs a minimum of space and enables it to measure in very small volumes. It also can be built into pH-electrode connections

General Data

Accuracy: ±0,5 mm
 Minimum difference in refractive index for interface detection: 0,01 R.I.
 Light source: infrared-light 930 nm
 Sensor length: 100...2000 mm
 minimum distance between Sensor tip and any opposite surface: >10 mm
 - in case of electropolished surface: >20 mm
 Orientation: any
 Connection: G1/2A
 Controller: amplifier type 720.2501.XY

Design Data

Operating and ambient temperature: -20 ... +60 °C
 Operating pressure: 0 - 3 MPa (0 ... 30 bar)
 Material Sensor-housing: 1.4571
 Material light guide: quartz glass
 Material packing: graphite
 Weight: 0,1 kg
 +5 g/cm elongation

Electrical Data

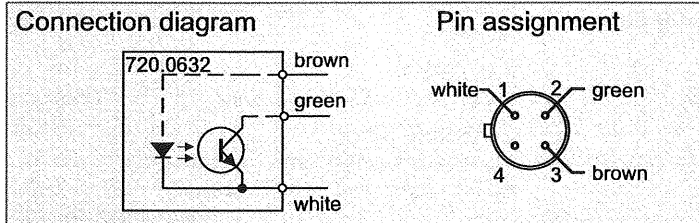
Supply, output: see controller type 720.2501.XY
 Connection: PVC-cabel 3*0,14 mm² or plug 4-pole series 713
 Ingress protection EN 60529 with plug: IP 65
 - with cable: IP 67

Accessories

Female plug for connector plug STK4713M12

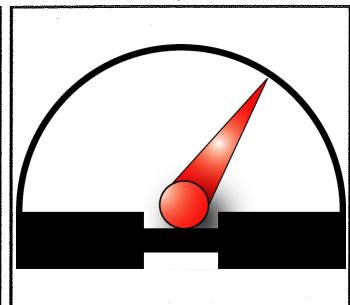
Certificates

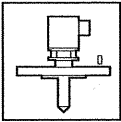
National technical approval WHG§19 (only for Germany) Z-65.14-1
 Subject to alterations



Ordering no.

7	2	0	.	0	6	3	2	X	X	X	X	-	X																																								
<table border="1"> <tr> <td>K</td><td>Kabel</td><td rowspan="2">electrical connection</td> </tr> <tr> <td>S</td><td>Stecker</td> </tr> <tr> <td>0</td><td>1</td><td>0</td><td>100 mm</td><td rowspan="5">sensor length SL [cm]</td> </tr> <tr> <td>0</td><td>1</td><td>5</td><td>150 mm</td> </tr> <tr> <td>0</td><td>2</td><td>5</td><td>250 mm</td> </tr> <tr> <td>0</td><td>5</td><td>5</td><td>550 mm</td> </tr> <tr> <td>1</td><td>0</td><td>5</td><td>1050 mm</td> </tr> <tr> <td>measure</td><td>interface</td><td>I</td><td>X</td><td>X</td><td>X</td><td>XXX0 mm custom spec.</td> </tr> <tr> <td></td><td>level</td><td>L</td><td>X</td><td>X</td><td>X</td><td></td> </tr> </table>														K	Kabel	electrical connection	S	Stecker	0	1	0	100 mm	sensor length SL [cm]	0	1	5	150 mm	0	2	5	250 mm	0	5	5	550 mm	1	0	5	1050 mm	measure	interface	I	X	X	X	XXX0 mm custom spec.		level	L	X	X	X	
K	Kabel	electrical connection																																																			
S	Stecker																																																				
0	1	0	100 mm	sensor length SL [cm]																																																	
0	1	5	150 mm																																																		
0	2	5	250 mm																																																		
0	5	5	550 mm																																																		
1	0	5	1050 mm																																																		
measure	interface	I	X	X	X	XXX0 mm custom spec.																																															
	level	L	X	X	X																																																

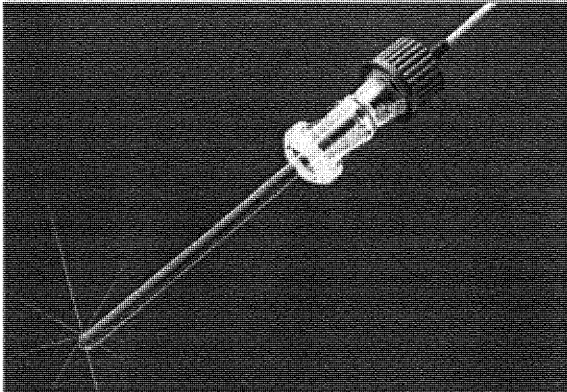




Laboratory Transducer

Optoelectronic liquid Level limit sensor completely made of glass

Product group	720
Type	0042
Page:	1/1
Revision:	4
Date:	4/05



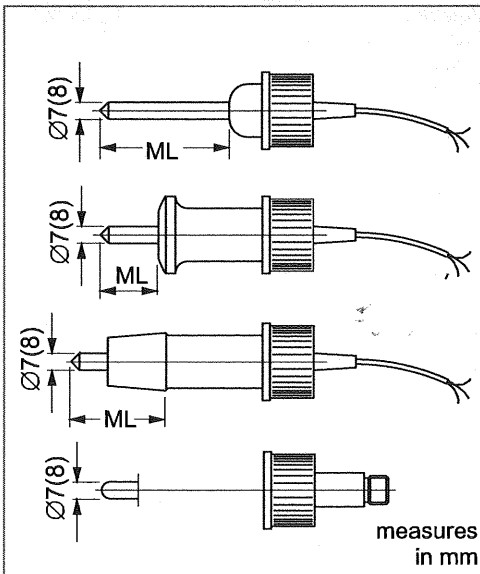
Version:
spherical
flange KF,
Level
sensor,
cable
connection

Field of application

This Optoelectronic limit sensor is for signalling liquid level and interface limits. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties such as density, dielectric constant, conductivity or colour. The very compact construction only needs a minimum of space and also enables it to measure very small volume levels.

General Data

Measuring accuracy:	±0,5 mm
Difference of Refractive Index for interface measurement min.:	0,01 R.I.
Light source:	IR-light 930 nm
Minimum distance Sensor tip to any opposite wall:	>10 mm
Measuring length ML maxl for Duran:	250 mm
for Quartz:	500 mm
Mounting direction:	any
Controller necessary:	Switch amplifier type 720.0250
Weight:	0.1 kg +1.3 g/cm ML



Design

- Stopper rod, Level sensor, Cable connection
- Connection spherical flange from KF15, Level sensor, Cable connection
- Connection Conic plug from NS19/26, Level sensor, Cable connection
- Interface sensor Plug connector

measures in mm

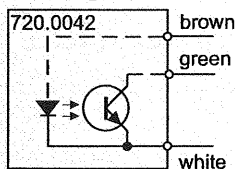
Design Data

Operating temperature:	- 60 to +250 °C
Ambient temperature:	-25 to +95 °C
Operating pressure:	0 - 0,5 MPa (0 - 5 bar)
Material Sensor-housing and sensor:	Quartz/Duran
Material light guide:	Quartz/Duran
Material screw-cap:	Plastics

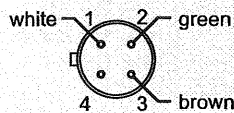
Electrical Data

Power supply:	see controller Type 720.0250
Connection:	PVC-cable 3*0,14 mm2 or 4 pole plug serie 713
Ingress protection acc. to EN 60529 with plug:	IP 65
with cable:	IP 67

Connection diagram



pin assignment

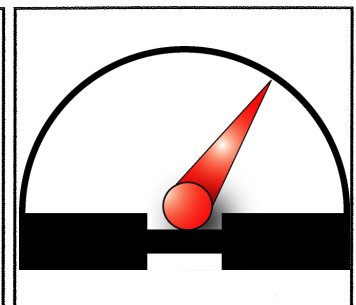


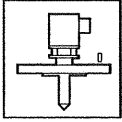
subject to alterations

Order No.

720.0042XVAR-XXXX

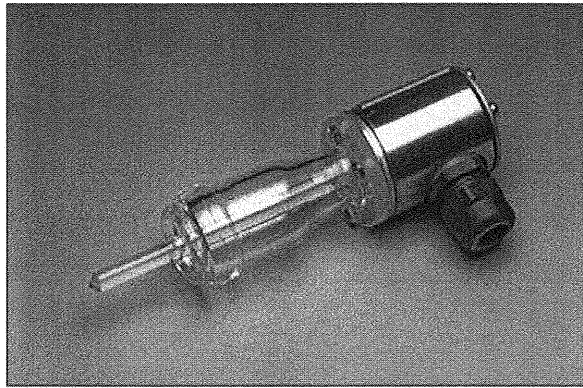
Measure	Interface	I						
	Level	L						
Glass material	Duran		D					Glass connection
	Quartz		Q					
electr. connection	Cable			K	X			Cable length in m
	Plug			S			e. g. 1=1 m	





Transducer
Optoelectronic liquid Level limit transducer All wetted parts from glass and hermetically sealed Special connections for glass apparatus

Product group	720		
Type	0642		
Sheet:	1/1	Revision:	2
Date:	7/03		



Con-
nection
type
büchiflex
sphere
DN 25
Level

Field of application

This Optoelectronic limit sensor is for signalling liquid level and interface limits. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties such as density, dielectric constant, conductivity or colour. The very compact construction only needs a minimum of space and also enables it to measure very small volume levels. It can be used for Ex Zone 0 and Zone 1.

General Data

Accuracy: ±0,5 mm
 Reproducibility: ±0,1 mm
 Difference of Refractive Index for interface measurement min.: 0,02 R.I.
 Light source: IR-Light 930 nm
 Ambient light: max. 100 Lux
 ML max: Borsilikat glass: 250 mm
 Quartz: 500 mm

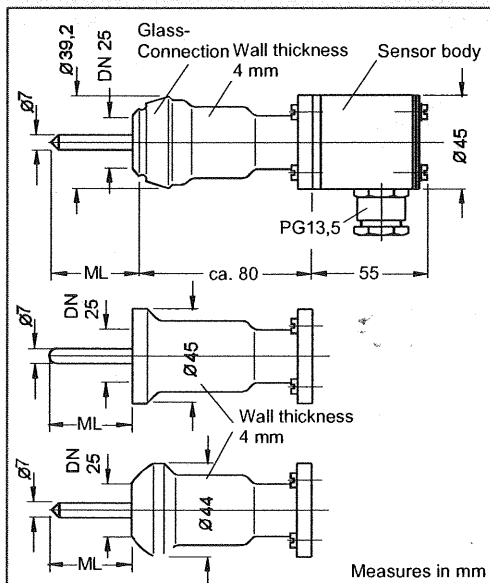
Mounting direction: any
 Minimum distance Sensor tip to any surface: > 10 mm
 Connection: Büchi sphere, KF sphere, DN 25
 Weight: ca. 0,4 kg + 1,3 g/cm ML

Design Data

Operating temperature: -50 to +200 °C (with PTFE-sealing)
 Ambient temperature: -50 to +95 °C
 Operating pressure: 0 -1 MPa (0 - 10 bar)
 Material Sensor/housing: Borosilikat glass 3.3, Quartz
 Material light guide: Borosilikat glass 3.3, Quartz
 Material sensor body: Stainless steel
 Ex protection: II 1/2 G EEEx ib IIC T5, T6
 T6: to 60 °C, T5: to 75 °C

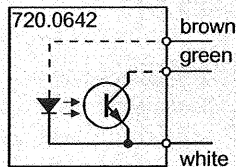
Electrical Data

Cable gland: M20x1,5, for Ex blue
 Screw terminals: 3 * 2,5 mm²
 Ingress protection EN 60529: IP 65



Connection type büchiflex sphere DN 25 Level
 Connection type büchiflex flat ground seal DN 25 Interface
 Connection type sphere KF 25 DN 25 Level

Connection Diagram

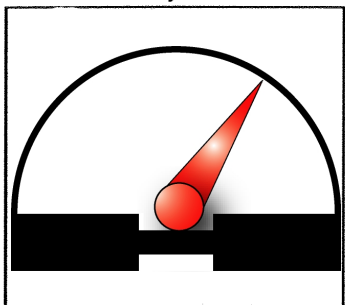


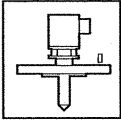
Certificates

EC-Type Examination Certificate: ZELM 02 ATEX 0087
 Zone 0 + 1, ASEV is included in ATEX
 Subject to alterations!

Ordering no.

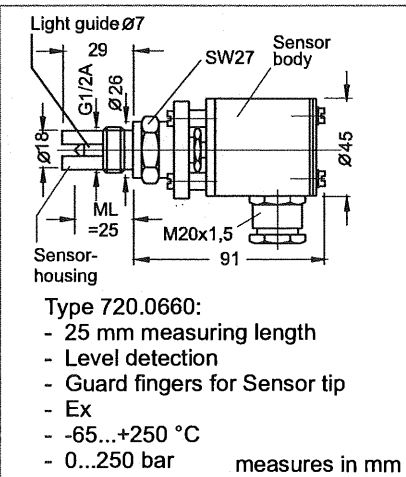
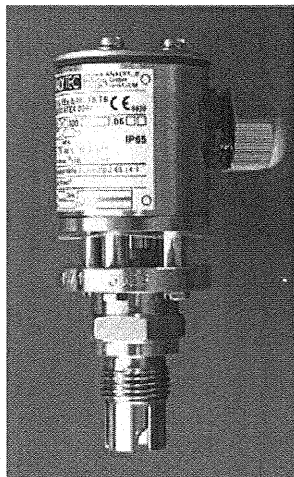
7	2	0	.	X	1	X	3	0	0	X	X	X	.	0	6	4	2	X	?	?	?	?	?	?	?
				1=Standard 2=Ex		1=Level 2=Interface		ML XXX in cm e.g.: 150 mm=015						B=büchiflex sphere P=büchiglass flat ground seal K=KF sphere ?=Code not in use											





Transducer
Optoelectronic liquid level limit Transducer

Product group	720		
Type	06XX		
Sheet:	1/2	Revision:	4
Date:	2/05		



Field of application

This Optoelectronic limit sensor is for signalling liquid level and interface limits. A big advantage is that to a great extent the optoelectronic sensor works independently of physical properties like density, dielectric constant, conductivity or color. The compact construction only needs a minimum of space and enables it to measure in very small volumes. Ex, Zone 0 and Yone 1.

General Data

Accuracy:	$\pm 0,5$ mm
Reproducibility:	$\pm 0,1$ mm
Smallest R.I.-difference for Interface measurement:	0,02 R.I.
Light source:	IR-Light 930 nm
Ambient light:	max. 100 Lux
Orientation:	any
Connection:	G1/2A, DIN 910
Conical nipple:	DIN 7603
Weight, Type 720.06X0:	0,77 kg + 9,3 g/cm ML
Type 720.06X9:	1,07 kg + 9,3 g/cm ML

Preferred dimensions

ML [mm]	Ordering no.			
	Level Standard	Level Ex	Interface Standard	Interface Ex
25	256941	257808	256958	256974
50	257477	258368	257584	257816
60	257485	257709	257592	257824
80	257493	257717	257600	257832
90	257501	257725	257618	257840
100	257519	257733	257626	257857
120	257527	257741	257634	257865
150	257535	257758	257642	257873
200	257543	257766	257659	257881
300	257550	257774	257667	257899
600	257568	257782	257675	257907
800	257576	257790	257683	257915

Design Data

Operating temp. Type 720.06X0:	-65 to +250 °C
Operating temp. Type 720.06X9:	-269 to +400 °C
Ambient temperature:	-65 to +95 °C
Operating pressure:	0 -25 MPa (0 - 250 bar)
Op. pressure special design:	0 - 50 MPa (0 - 500 bar)
Material Sensor-housing:	1.4571, Hastelloy, ...
Material light guide:	Clad core glass, Quartz Sapphire (max. ML=60 mm)
Material packing:	Graphite
Material housing:	Stainless steel
Ex protection:	II 1/2 G EEx ib IIC T5, T6 T6: bis 60 °C, T5: bis 75 °C

Electrical Data

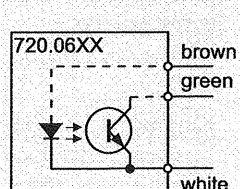
Cable gland:	M20x1,5, blue for Ex
Screw terminals:	3 * 2,5 mm ²
Ingress protection EN 60529:	IP 65

Certificates

EC-Type Examination Certificate: ZELM 02 ATEX 0087
 Zone 0 + 1, ASEV is included in ATEX
 SIL level acc. to IEC 61508: SIL1, in connection with amplifier type 720.2502

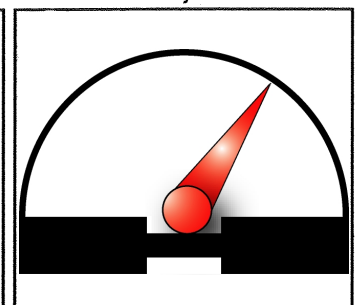
Subject to alterations

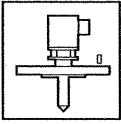
Connection diagram



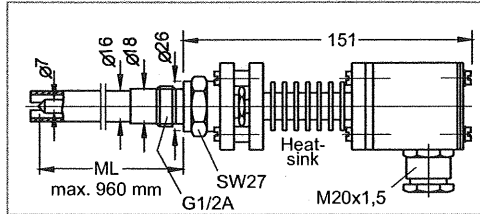
Ordering no.

7 2 0 . X 1 X 3 0 0 X X X . 0 6 X X			
Applic- cation	Standard	1	T _{Proc}
	Ex	2	
Measure	Level	1	Elongation
	Interface	2	
Measuring length	Measuring length in cm e. g. 150 mm = 015		X X X
	0	-65 ... +250 °C	
9	-269 ... +400 °C		

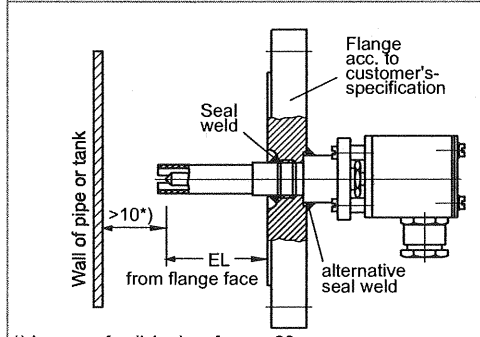




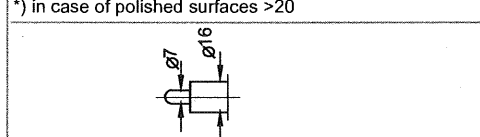
Transducer	Product group 720	
	Type 06XX	
	Sheet: 2/2	Revision: 3
	Date: 7/03	
Application hints		



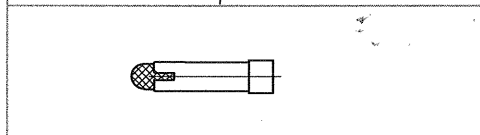
Type 720.0689
variable ML
Level detection
Guard fingers for
Sensor tip
-269...+400 °C
0...250 bar



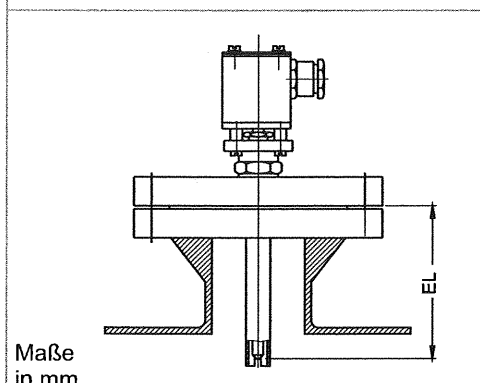
Type 720.0680
variable ML
Level detection
Flanged with
seal weld
Guard fingers for
Sensor tip
-65...+250 °C
0...250 bar
Material and type of
flange acc. to
customer's spec.



Interface detection
Sensor tip bare



Design with
sieve Nr. 59390001
for diversion of gas
bubbles from
sensor tip

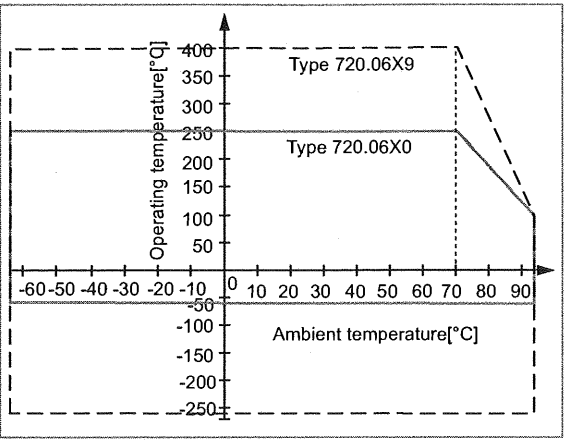


Installation top
mounted into
flange piece
e.g. as Overfill
prevention device

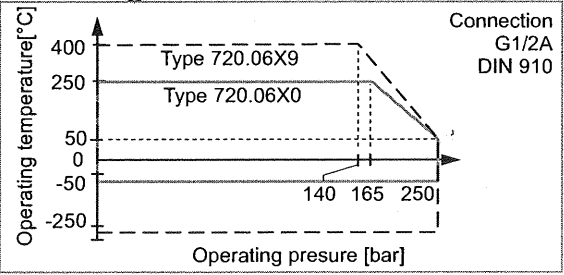
EL=Installation
length from
flange face
=ML - flange
thickness

Maße
in mm

Derating-Diagram



P-T-Diagram



Flanges

DIN: from DN25 PN6, DL A/B/C/D/E, F/FA/N/NA
V13/R13/V14/R14, M/L
ANSI: from 1" ANSI 150, FF/RF/RJ(RTJ), LT/LG/ST/SG
LM/LF/SM/SF
Material: 1.4571, Hastelloy, Inconel
Incoloy, Monel, Titanium, Tantalum
Installation: Transducer screwed into flange or
seal welded with flange

Joint rings

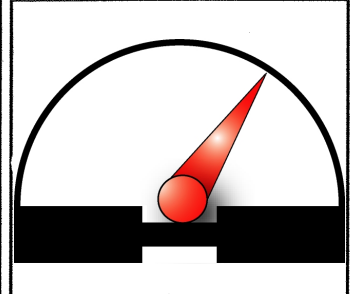
D21 x 26 DIN 7603 for connection G1/2A
-10 to 400 °C: 1.1003 (soft iron)
-196 to 30 °C: 2.0090 (copper)

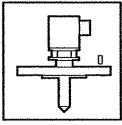
Subject to alterations

Ordering no. for Accessories
Flanges, material 1.4571, in parts

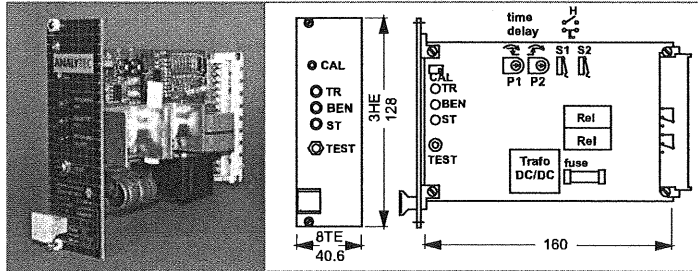
DN25 PN40 RF	5751432859B
DN25 PN40 groove	5751431759B
DN25 PN40 tongue	5751432959B
DN40 PN40 RF	5751631459B
DN40 PN40 groove	5751431959B
DN40 PN40 tongue	5751631859B
DN50 PN40 RF	5751631159B
DN50 PN40 groove	5751631759B

DN50 PN40 tongue	5751632459B
DN16 PN325 L	5751331659B
DN24 PN325 L	5751335559B
Seal weld	193798
Sensor protection	
sieve, material 1.4571	59390001
Joint rings	
Mat. 1.1003 D21x26 DIN 7603, sph.	D07603921026
Mat. 2.0090 D21x26 DIN 7603 Cu	D07603C26021

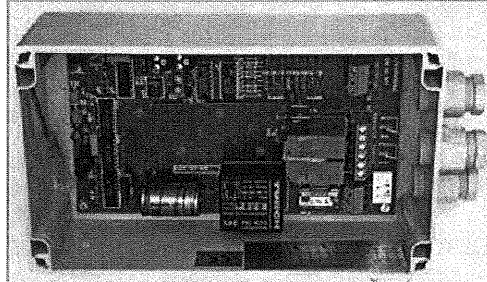




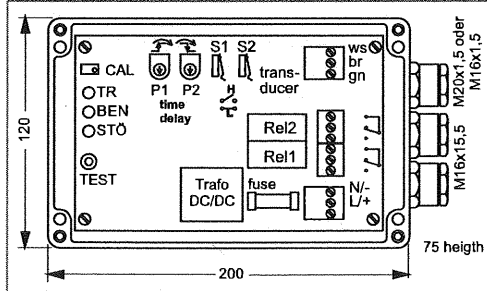
Controller	Product group 720	
	Type 250Y	
	Sheet: 1/1	Revision: 7
	Date: 2/05	
Controller and power supply for Optoelectronic Transducers Type 720.0032/0042/06XX Separate relays and indications for DRY/WET Continuous self checking of sensor, connections and controller Manual Test of relay and external signal devices by TEST-button		



Type 19"-plug in module. Rack connector 32-pole DIN 41612 Form F. Switches for setting of switch direction and time delay. Pots for time delay are protected. Cal pot and TEST button are on front panel.



Housing Type.
The housing is covered with a transparent lid, so that LEDs for DRY, WET and FAILURE can be seen. Ingress protection IP65 ensures that this controller can be used outside.



Measures in mm

Field of application

The Controller will be operated in safe area. The output is intrinsically safe Ex ib IIC and for use with the transducer Type 720.06XX only.

General Data

Function modes: Switch direction H or L settable
Rise and falltime for relay signal settable appr. 8 s

Fail safe modes: Short circuit, open circuit interruption between sensor and controller voltage failure, sensor component failure

Design Data

Ambient temperature
19"-plug in module: -25 to +60 °C
Housing: -40 to +40 °C

Weight
19"-plug in module: 0,31(0,36) kg
Housing: 0,6 (0,73) kg

Controller output: II (2) G [Ex ib] IIC
Inductivity L_{max}: 0,5 mH
Capacity C_{max}: 3 µF
U: ≤9,6 V
I: ≤149 mA
P: ≤1,0 W

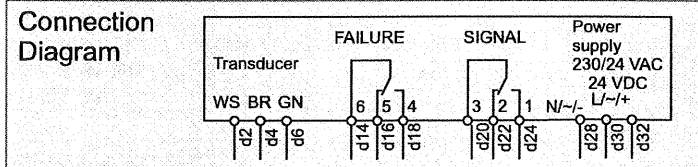
Electrical Data

Power supply voltage: 230/115/120/24 V~/24 V=
Power consumption: 2,8 VA/3 W
Outputs: Signal-Relay, SPDT, 250 V/3 A/100 VA
Failure-Relay, SPDT, 250 V/3 A/100 VA

Cable glands: M16x1,5/M20x1,5 blue for Ex
Wire cross section max.: 2,5 mm²
Cable length: 175 - 600 m for 0.5 - 1.5 mm²
Ingress protection EN 60529:
19"-plug in module: IP 20
housing: IP 65

Certificates

EC-Type Examination Certificate: ZELM 02 ATEX 0106 (also valid for ASEP)
SIL level acc. to IEC 61508: SIL1, in connection with transducer type 720.06XX



Ordering No. **720.250Y.XX**

Type	Standard	1		
	Ex	2		
Supply	230 V/50...60 Hz	1		
	115/120 V/50...60 Hz	2		
	24 VAC/50...60 Hz	3		
	24 VDC with isolation	4	1	Plastic housing
	24 VDC without isolation	7	7	19"-plug-in module
				Housing

