Contrans P
HART® Transmitter

ASD 800 / 810
with Remote Seal for Gauge / Absolute Pressure and Level

Span: 60 mbar to 600 bar (16 bar abs)
(6 kPa to 60,000 kPa)
(6 kPa to 1,600 kPa abs)

10/15-6.24 EN

(624.bmp)

- Isolation between Process and Transmitter with Measuring Media having: • High Temperatures and Viscosities •Corrosive Ingredients, a Tendency to Polymerization
- Prevention of Deposits in the Process Connection Flanges by Extended Remote Seals
- Mounting to various DIN or ANSI Flanges
- Microprocessor technology
- HighTurn down ratio 30 : 1
- Digital communication using the "HART"-Protocol without disturbing the output signal 4...20 mA
- Lower range value, span and damping are externally adjustable
- Transfer response configurable:
  • linear • freely programmable • PID-controller
- "Intrinsic Safety" or "Flameproof Enclosure" explosion protection or mounting on "Zone 0"
- E.M.C. according to IEC 801

The transmitter ASD 800 / 810 combines proven, mature technology with a trend-setting microprocessor controlled electronic.
It is based on a proven, highly-stable measuring sensor, on which a remote seal is fitted. The pressure present is transferred via the diaphragm and the filling liquid to the internal sensing diaphragm in the measuring sensor and converted into an electrical signal by the electronics. The remote seals, which depending on type, are either connected directly to the transmitter or via a flexible capillary tube. The length of the capillary tube is determined by the location and mounting position. Apart from the high accuracy, with an almost complete compensation of ambient influences, both measuring sensor and electronic provide a substantial increase in functionality. The digital indicator can be so configured that the measured value is shown as a physical unit, percentage value or current. In addition the measuring sensor temperature can be indicated. The process wetted parts of the remote seal can be selected from various materials, i.e. Stainless Steel, Hastelloy C or Tantalum, depending upon the required resistance to corrosion. Various filling liquids, for example for the food and beverage industry, complete the spectrum of applications.
The Transmitter ASD 800 / 810 with remote seal is thus an efficient, intelligent element, a must for every type of automation.

Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

Technical Data

Measuring Mechanism

Measuring limits

ASD 800: -100% (≥ -1 bar) and +100% of the max. span

ASD 810: 0% and +100% of the max. span

Lower range value

Continuously adjustable between the measuring limits

Span

The min. and max. span is depending of the Remote Seal Type and the Nominal Pressure. Span values see Table 1 on side 4. The span is continuously adjustable.

Characteristic

• Linear, rising or falling • Freely programmable

Over-ranging limit

Order No. V15956AE or V15957AE:

ranges ≤ 400 mbar: 10 bar
range 2.5 bar: 25 bar
range 16 bar: 32 bar

Order No. V15936AE:

ranges 2.5 bar...250 bar: 2 times the range end value
range 600 bar: 900 bar

Materials of Process Wetted Parts

see Ordering Data

Materials of non Process Wetted Parts

- Capillary tube: Stainless Steel
- Protective tube: Stainless Steel or with PVC covering
- Flange: Stainless Steel

Power Supply

Transmitter operating voltage

$U_{B,max}$= DC 45 V $U_{B,min}$= DC 11.5 V

Output signal

4...20 mA

Output signal limits

I_{min} 3.5 mA, I_{max} 22.5 mA

Standard adjustment: I_{min} 3.8 mA and I_{max} 20.5 mA

Load R

$$R \leq \frac{U_S - 11.5V}{I_{max}}\ k\Omega \qquad U_S = \text{Supply voltage} \qquad I_{max} = \text{20...22.5mA (adjustable)}$$

Digital Communication

Standardized communication protocol "HART" 5.1

Minimum load for communication: 250 Ω

Recommended lead-length for communication:

- screened multi-wire: max. 1.5 km
- screened two-wire: max. 3 km

Max. permissible voltage ripple of the power supply during communication:

- 7 V_{pp} at 50 Hz ≤ f ≤ 100 Hz
- 1 V_{pp} at 100 Hz < f ≤ 200 Hz
- 0.2 V_{pp} at 200 Hz < f ≤ 300 Hz

The following can, for example, be configured:

- Digital indication of process pressure, temperature, percentage value, current, arbitrary process variables
- Damping
- Transfer function
- Alarm signalling I_{min} / I_{max}
- PID Controller; adjustment with five parameters
  • Setpoint w • Proportional gain K_p • Reset time T_n
  • Derivative gain K_D • Derivative action time T_D

Write-over of parameters can be prevented by interlocking write-over protection. All stored data is secured even in the event of power supply failure.

A detailed description of all functions can be found in the Instructions 42/15-910 EN.

General and Safety Data

Ambient Conditions

Storage and transport temperature range

-50 °C...+80 °C

Transmitter

Ambient temperature

minimal: dependent of the filling liquid, maximal: +80°C

Medium temperature at remote seal

Directly connected:

Ambient temperature ≤ 40°C: max. +180°C
Ambient temperature +60°C: max. +140°C
minimal medium temperature dependent on the filling liquid (see Table 2, page 4)
Remote seal with Running Union and Buna O-ring maximal +120°C

with Capillary tube:

dependent on the filling liquid (see Table 2, page 4) with the following restrictions:

- Flush diaphragm DN25 / DN 1": maximal +250°C
- Flush diaphragm, Mat'l: tantalum: maximal +220°C
- In-line remote seal DN 25 / DN 1": maximal +250°C

Humidity

≤95%, annual mean, condensation permissible

Amplifier Enclosure, Weight

Material

Die cast copperfree aluminium (GD-AlSi) / polycarbonate

Protective varnish

Epoxy resin, gravel-grey, RAL 7032

Degree of Protection

IP 65 (jet waterproof) according to EN 60 529
(≡ NEMA standard type 4)

Weight

- Flange Remote Seals with Flush diaphragm / Extended diaphragm DN 50 / 2", DN 80 / 3":
  - DN 50, PN 16/40 with Flush diaphragm: approx. 3.3kg
  - DN 2", Class 300 with Flush diaphragm: approx. 3.7kg
  - DN 50, PN 16/40 with Extended diaphragm 100mm: approx. 4.0kg
  - DN 2", Class 300 with Extended diaphragm 100mm: approx. 5.4kg
  - DN 80, PN 16/40 with Flush diaphragm: approx. 5.8kg
  - DN 3", Class 150 with Flush diaphragm: approx. 5.3kg
  - DN 80, PN 16/40 with Extended diaphragm 100mm: approx. 7.5kg
  - DN 3", Class 150 with Extended diaphragm 100mm: approx. 7.0kg
- Flush Diaphragm Remote Seals DN 25 / DN 1", Miniature Remote Seals, In-line Remote Seals and Fast Coupled Remote Seals: see Dimensional Diagrams.

In addition to the quoted weights, the weight of the transmitter, approx. 1.4 kg and the weight of the capillary tube, if fitted at approx. 0.15 kg / m, must be added.

Mounting

Mounting Instructions

- Remote Seal with Capillary Tube:
  The maximun difference in height between the remote seal and the transmitter when mounting the remote seal **below** the transmitter is:
  with silicone oil (IC) 5 m
  with carbon fluoride (L)2.5 m
  with high temperature oil (IH)5 m
  with vegetable oil (PF)2.5m
  With an operating pressure < 1000 mbar abs, the transmitter must be mounted below the remote seal.

The minimum bending radius of the capillary tube is 75 mm; do not kink!

Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

Technical Data

Mounting

- Flange Remote Seal with Flush / Extended diaphragm
  The remote seal is mounted at the connecting flange on site. Only gaskets of soft materials to be used with remote seals having diaphragms and sealing surfaces made of tantalum (Gasket not supplied).
- In-line Remote Seal
  The remote seal is mounted direct in the process piping between two flanges.
- Remote Seal with Fast Coupling
  The remote seal is mounted directly onto the process via either a Running union or a clamp connection.
- Miniature Remote Seal
  The threaded remote seal is screwed with the available threaded process connector.
- Transmitter
  The transmitter is wall or pipe mounted or by an instrument support fitting according to DIN 16 281, when the transmitter is connected to the remote seal with a flexible capillary tube. When the transmitter is directly connected to the remote seal then no supplementary mountings or supports are necessary.

Dimensions

see Dimensional Diagrams.

Transient Response (at reference conditions)

(see Instruction 42/15-936 EN for further data)
All values are limit values and refers to the output span. The effects identified with a ⋆ are with reference to the measuring range and are to be multiplied by the turn-down factor. The ratio range/calibrated span should be as small as possible.
However the limit values and response times are dependent upon the remote seal and the measuring point.
Data for the instrument combination are first possible after knowledge of all the data submitted in the questionnaire 80/15-105 EN (see pages 13 and 14).
Data for transmitter (without effect from the remote seal):

Conformity[1]	
including hysteresis and dead band,	
terminal-based	0.1 %
Hysteresis[1]	0.05 %
Power supply	
Voltage effect per Volt	0.005 %

The following specifications are valid for a linear transfer function. The effect appearing at the output with non linear transfer functions is dependent on the function and is to be calculated accordingly.

Ambient temperature effect according to DIN 16 086	
Thermal change (-20°C...+60°C)	
⋆ on zero	0.1 %
on span	0.1 %
Temperature coefficient (-40°C...+80°C)[2]	
⋆ on zero	0.05 %/10K
on span	0.05 %/10K
⋆ Long-term drift within 6 months	0.05 %
Rise time according to DIN 16 086	
dependent on range and	
turn-down factor	0.15...1.3 s
additional adjustable time constant	0...60 s

[1] Additionally with turn-down factor >1:10

$$\pm \left(0.005 \times \frac{\text{Measuring range}}{\text{adjusted span}} - 0.05\right) \%$$

[2] With carbon fluoride filling liquid (only Order No. V15936AE...) -20°C...+80°C

Explosion Protection

● for "Zone 0"

Type Approval (Germany only)
according to VbF (German Regulations for Flammable Liquids) "Zone 0"

Instrument Construction (Germany only)
The instrument combination consists of 1 remote seal and the associated transmitter. The remote seal is installed on the "Zone 0" measuring point.
The transmitter must be designed in the "Intrinsic Safety EEx i" or "Flameproof Enclosure EEx d" Type of Protection.

● for "Zone 1"

When the transmitter is installed in "Zone 1", the type of protection "Intrinsic Safety EEx i" is sufficient.
PTB-No. Ex-93.C.4004 (ASD 800/810)

Explosion protection Intrinsic Safety "i"
Identification Code (DIN EN 50 014): EEx ia IIC T6
Type Approval Certificate: PTB No. Ex-93.C.4004,
copy can be obtained under No. 49/15-34 EX.
Connected to an intrinsically safe current circuit with the following max. values:

Temperature class	U_{max}	I_{max}	P_{max}	Max. ambient temperature
T6	45 V	130 mA	0.5 W	40 °C
T5	45 V	130 mA	0.8 W	40 °C
T4	45 V	130 mA	1.0 W	80 °C
T4	45 V	130 mA	1.2 W	60 °C

internal capacitance $C_{eq} \leq 0.010$ µF
internal inductance is negligably small

Explosion protection Flameproof Enclosure "d"
(Only with Order No. V15936AE...)
Identification Code (DIN EN 50 014): EEx d IIC T6
Type Approval Certificate: PTB No. Ex-91.C.1077
Operating conditions: max. ambient temperature 75°C
Test Certificat can be obtained under No. 49/15-33 EX.

● for "Zone 2"

BASEEFA Type N Approval (BS 6941)
Ex N IIC T5 (T_{amb}: -40 °C up to +80 °C)

Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

Technical Data

Table 1: Type of Construction, Spans and Lengths of Capillary tube

Remote Seal Type		Nominal Diameter	Spans min / max	max. Length of Capillary Tube
Flush Diaphragm		DN 25 / DN 1"	1.6 bar / 250 bar	6 m
		DN 50 / DN 2"	100 mbar / 100 bar	16 m
		DN 80 / DN 3"	60 mbar[1] / 100 bar	16 m
Extended Diaphragm		DN 50 / DN 2"	160 mbar / 100 bar	16 m
		DN 80 / DN 3"	60 mbar[1] / 100 bar	16 m
In-Line Remote Seal		DN 25 / DN 1"	4 bar / 250 bar	4 m
		DN 40 / DN 1 1/2"	2.5 bar / 250 bar	6 m
		DN 50 / DN 2"	2.5 bar / 250 bar	8 m
		DN 80 / DN 3"	2.5 bar / 250 bar	16 m
with Fast Coupling	Running Union acc. to DIN 11 851	DN 50	1.3 bar / 25 bar	--
	Clamp-connection	DN 2"	6 bar / 40 bar	--
Miniature Remote Seal		G 1 A	6 bar / 600 bar	--
		G 1 1/2 A	1.2 bar / 600 bar	--

[1] With ASD 810 use 400 mbar abs. range.

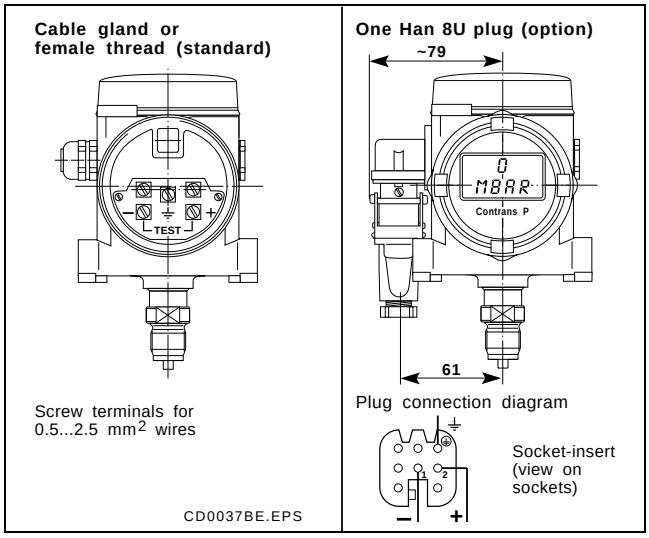
When selecting transmitter range please take nominal pressure (PN) of Remote seal into consideration!

Table 2: Application Limits: permissible Temperature / Minimum Operating Pressure

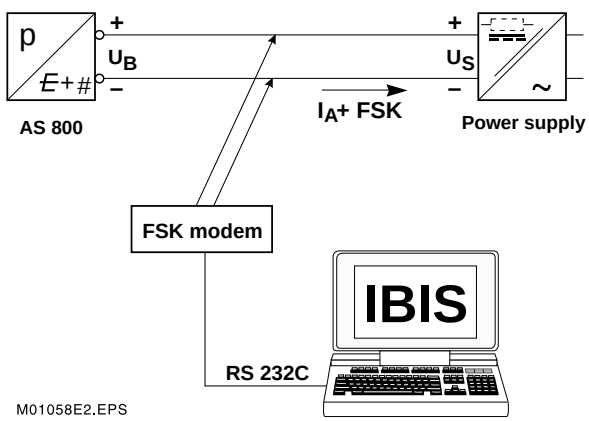
Attention:
- The pressure has to be linearly interpolated between the stated temperatures.
- Flush diaphragm remote seals with **tantalum diaphragm** (Code-No. P02, P05, P08, P11, P14, P17, P20, P23) should not be used with operating temperature > 220°C.

Filling liquid	Silicone Oil	Carbon Fuoride	High-temperature Oil	Vegetable Oil	Vacuumproof Design
Identification	IC	L	IH	PF	IC
Density at 20°C in kg/m³	1055	1880	1070	920	1055
Operating Temperature in °C	-30...+250	-30...+150	-10...+400	-10...+250	-30...+200
Pressure rating in mbar abs.					
at 20°C	> 500	> 1000	> 500	> 500	> 5
100°C	> 500	> 1000	> 500	> 1000	> 25
150°C	> 500	> 1000	> 500	> 1000	> 38
200°C	> 750	---	> 750	> 1000	> 50
250°C	> 1000		> 1000	> 1000	---
400°C	---		> 1000	---	

Electrical Connections



Functional Diagram-Communication



Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

Ordering Data

	Order No.							
Transmitter ASD 800 / ASD 810	**V159**		**AE-**					
Measuring range (ASD 800 for Gauge Pressure / Level)								
0 ... 60 mbar (6 kPa)		56		10X	X10			
0 ... 400 mbar (40 kPa)		56		10X	X14			
0 ... 2.5 bar (250 kPa)		56		20X	X18			
0 ... 16 bar (1600 kPa)		56		20X	X22			
0 ... 40 bar (4000 kPa)		36		20X	X24			
0 ... 100 bar (10000 kPa)		36		20X	X26			
0 ... 250 bar (25000 kPa)		36		20X	X28			
0 ... 600 bar (60000 kPa)		36		10X	X30			
adjusted from ... to ... mbar/bar/kPa [1] or in acc. with questionnaire [2] (data is necessary)						Y04		
Measuring range (ASD 810 for Absolute Pressure)								
0 ... 400 mbar abs. (40 kPa abs.)		57		10X	X70			
0 ... 2.5 bar abs. (250 kPa abs.)		57		20X	X74			
0 ... 16 bar abs. (1600 kPa abs.)		57		20X	X78			
adjusted from ... to ... mbar/bar/kPa abs. [1] or in acc. with questionnaire [2] (data is necessary)						Y04		
Vacuum measurement								
Vacuumproof design (is always necessary with ASD 810)						739		
Filling liquid (in measuring mechanism, only with ASD 800 with Order No. V15936AE...)								
Silivone oil						070		
Carbon fluoride (min. ambient temperature -20°C)						133		
Output signal								
4 ... 20 mA, linear						023		
4 ... 20 mA, Characteristic acc. to table of values, max. 22 pairs: **Input (%); Output (%)**						221		
Electrical connection								
One Pg 13.5 cable gland						044		
Two Pg 13.5 cable gland						268		
Two $^1/_2$-14 NPT female threads						270		
One plug connector (Han 8U)						272		

The three-digit code numbers are added to the order number, separated by diagonal strokes.
Further instrument variations on the next page.

[1] Possible units: mbar, bar, Pa, kPa, mmH_2O, mmHg, psi, g/cm^2, kg/cm^2, inches H_2O, inches Hg, feet H_2O.

[2] Completed questionnaire (pages 12/13) necessary, when connection via capillary tube takes place and remote seal and transmitter are not at the same height.

Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

Additional Ordering Data for ASD 800 / ASD 810

Instrument Options	Code-No.			
Explosion Protection				
Ex-design: EEx ia IIC T6	557			
Eex d IIC T6 } only with Order No. V15936AE...	558			
FM Explosion Proof } and in conjunction with Code-No. 270	552			
CSA Intrinsically Safe	561			
BASEEFA Type N , Ex N II C T5	274			
Indicating instrument				
Analogue indicating instrument (Scale: 0...100% linear):				
Normal or Ex "i" design	206			
Digital indicating instrument (indicates %. However with Code-No. 415: process pressure):				
Normal- or Ex-design EEx ia	244			
Digital indicating instrument (indicates %. However with Code-No. 415: process pressure):				
Ex-design EEx d	245			
Scale indication... (please define value: e.g. 0...15 m[1]; 4...20 mA proportional; only combinable with Code-No. 244/245, not with Code-No. 415)	416			
Programmable Parameter				
PID-Controller,	415			
Parameter: nominal value in %; K_p (0...40); T_n in sec. (0,1...3600); K_D (0...40); T_D in sec. (1...3600) [2]				
Alarm signalling with 3.6 mA (standard: 21 mA)	417			
Maximal output current ...	418			
(please state value 20...22.5 mA; Standard: 20.5 mA)				
Minimal output current ...	420			
please state value 3.5...4 mA; Standard: 3.8 mA)				
Electrical Damping TG=...	259			
(state value to be adjusted, 0...60 s)				
Tagging				
on Type plate (maximal 32 characters)	205			
on Tie-on plate, Mat'l stainless steel (maximal 32 characters)	202			
Mounting bracket				
Bracket for wall mounting (carbon steel)	141			
Bracket and U-bolts for 2" pipe mounting (carbon steel)	142			
Bracket for wall mounting (stainless steel)	143			
Bracket and U-bolts for 2" pipe mounting (stainless steel)	144			
Instructions [3]				
german	Z2D			
english	Z2E			
french	Z2F			

The three-digit code numbers are added to the order number, separated by diagonal strokes.

1) Possible units: pressure units, as listed under "adjusted from ... to ... "; m, cm, mm, inches, feet, m^3, l, barrels, gallons, $yard^3$, $inches^3$, $feet^3$, g, kg, t, pounds, short tons, long tons (further units see Technical Information: B 92 M 508 V)

2) To optimise the process it is necessary to have the additional facilities available with IBIS and a modem.
When no values stipulated-standard values will be programmed i.e. setpoint = 50% and K_p = 1. T_n , K_D and T_D are switched off (0).

3) One "german" copy included in the scope of supply - no specification required.
Further operating instructions have to be charged (please indicate number of copies).

Scope of Supply:
1 Instructions
1 Instrument socket with plug connector

Supplied against special order:
Power supply e.g. TZN 128 (Data Sheet 18-8.39 EN),
Mounting Accessories (Data Sheet 15-8.98 EN),
Communication software "IBIS" (Data Sheet 15-6.96 EN),
FSK-Modem for the digital Communication (Data Sheet 15-6.97 EN),
Spare Parts Transmitter ASD.

Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

Flush Diaphragm Remote Seal DN 25 / DN 1" (with internal diaphragm)					
Varianten		Code-Nr.			
Remote Seal Mounting [1]					
Direct mounting (**without** capillary tube)		699			
Mounting to pressure-measuring mechanism **with** capillary tube		754			
Materials					
Diaphragm and sealing surface, Material: stainless steel 316 Ti st.st. (1.4571)					
Sealing ring (only with nominal pressure up to PN 63 or 600 psi) PTFE					
Flange					
acc. to DIN 2501, Mat'l 316 Ti st.st. (1.4571)					
Nominal Diameter	Pressure rating	Sealing Surface			
DN 25	PN 10/40	Form D (DIN 2526)	P70		
DN 25	PN 10/40	Form N (DIN 2512)	P71		
DN 25	PN 63/100	Form D (DIN 2526)	701		
DN 25	PN 160	Form D (DIN 2526)	702		
DN 25	PN 250	Form D (DIN 2526)	703		
acc. to ANSI B 16.5, Mat'l 316 Ti st.st. (1.4571)					
Nominal Diameter	Pressure rating	Sealing Surface			
DN 1"	Class 150 psi	Form RF	P72		
DN 1"	Class 300 psi	Form RF	P73		
DN 1"	Class 600 psi	Form RF	706		
DN 1"	Class 1500 psi	Form RF	707		
Filling liquid [1]					
Silicon oil			074		
Vakuumproof design			739		
Lengths of capillary tube (standard lengths)					
1 m			755		
2 m			757		
4 m			759		
6 m			760		
Special lengths between 1m and 6m:					
Basic price of the next longer standard length plus an extra fee			764		
Special Features					
Capillary tube with PVC protective cover			775		
Ex-Design for "Zone 0" (only with Code-Nos. 557 or 558)			689		
Other variations regarding Pressure rating, Materials, Sealing surfaces, Filling liquids **on request**.					

The three-digit code numbers from the remote seal are added to the order number of the transmitter, separated by diagonal strokes.

[1] When mounted on an absolute or gauge pressure transmitter for measurement ≤ 500 mbar (abs.), the Vacuumproof design must be ordered (Code-No. 739).

Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

Flush Diaphragm Seal / Extended Diaphragm Seal DN 50 / DN 2" complete with Flange

Options			Code-No.			
Remote Seal Mounting						
Direct mounting (**without** capillary tube)			699			
Mounting to pressure-measuring mechanism **with** capillary tube			754			
Nominal Diameter	**Sealing Surface**	**Diaphragm / Sealing Surface Material**				
DN 50	Form E (DIN 2526)	316 L st.st. (1.4404)	P00			
		Hastelloy C	P01			
		Tantalum	P02			
	Form V13 (DIN 2513)	316 L st.st. (1.4404)	P03			
		Hastelloy C	P04			
		Tantalum	P05			
	Form N (DIN 2512)	316 L st.st. (1.4404)	P06			
		Hastelloy C	P07			
		Tantalum	P08			
DN 2"	Form RF (ANSI B 16.5)	316 L st.st. (1.4404)	P09			
		Hastelloy C	P10			
		Tantalum	P11			
Pressure rating						
DN 50	PN 16 / 40		P30			
	PN 64		P31			
	PN 100		P32			
DN 2"	Class 150 psi	only in conjunction with Sealing Surface "Form RF"	P33			
	Class 300 psi		P34			
	Class 600 psi		P35			
Flush diaphragm / Extended diaphragm						
Remote seal with Flush diaphragm (without Extension)			P50			
Remote seal with Extension (not combineable with diaphragm material "Tantalum")						
DN 50 / DN 2"	Extension, Mat'l 316 L st.st. (1.4404)	Extension length 50mm	P51			
		Extension length 100mm	P52			
		Extension length 150mm	P53			
	Extension, Mat'l Hastelloy C	Extension length 50mm	P54			
		Extension length 100mm	P55			
		Extension length 150mm	P56			
Filling liquid (data always necessary) [1]						
Silicone oil			074			
Carbon fluoride			687			
Vegetable oil (suitable for the use in the food and beverage industry)			673			
High-temperature oil (not for directly connection, Code-No. 699)			663			
Vacuumproof Design			739			
Lengths of capillary tube (standard lengths)						
1 m			755			
2 m			757			
4 m			759			
6 m			760			
8 m			761			
11 m			762			
16 m			773			
Special lengths between 1m and 16m:						
Basic price of the next longer standard length plus an extra fee			764			
Special features						
Diaphragm with FEP-coating (for Mat'l 316 L st.st. (1.4404) and Hastelloy C, medium temperature ≤ 150 °C)			662			
Capillary tube with PVC protective cover			775			
Ex-Design for "Zone 0" (only with Code-Nos. 557 or 558)			689			

Other variations regarding Pressure rating, Materials, Sealing surfaces, Filling liquids **on request**. For mounting from **Remote seals in "Sandwich"-construction** (additional blank flange required) **see Data Sheet 15-8.14 EN**.

The three-digit code numbers from the remote seal are added to the order number of the transmitter, separated by diagonal strokes.

[1] When mounted on an absolute or gauge pressure transmitter for measurement ≤ 500 mbar (abs.), the Vacuumproof design must be ordered.

Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

Flush Diaphragm Seal / Extended Diaphragm Seal DN 80 / DN 3" complete with Flange

Options			Code-No.				
Remote Seal Mounting							
Direct mounting (**without** capillary tube)			699				
Mounting to pressure-measuring mechanism **with** capillary tube			754				
Nominal Diameter	**Sealing Surface**	**Diaphragm / Sealing Surface Material**					
DN 80	Form E (DIN 2526)	316 L st.st. (1.4404)	P12				
		Hastelloy C	P13				
		Tantalum	P14				
	Form V13 (DIN 2513)	316 L st.st. (1.4404)	P15				
		Hastelloy C	P16				
		Tantalum	P17				
	Form N (DIN 2512)	316 L st.st. (1.4404)	P18				
		Hastelloy C	P19				
		Tantalum	P20				
DN 3"	Form RF (ANSI B 16.5)	316 L st.st. (1.4404)	P21				
		Hastelloy C	P22				
		Tantalum	P23				
Flange / Pressure rating							
DN 80	PN 16 / 40		P36				
	PN 64		P37				
	PN 100		P38				
DN 3"	Class 150 psi }	only in conjunction with Sealing Surface	P39				
	Class 300 psi }	“Form RF”	P40				
	Class 600 psi }		P41				
Flush diaphragm / Extended diaphragm							
Remote seal with Flush diaphragm (without Extension)			P50				
Remote seal with Extension (not combineable with diaphragm material “Tantalum”)							
DN 80 / DN 3"	Extension, Mat’l 316 L st.st. (1.4404)	Extension length 50mm	P57				
		Extension length 100mm	P58				
		Extension length 150mm	P59				
	Extension, Mat’l Hastelloy C	Extension length 50mm	P60				
		Extension length 100mm	P61				
		Extension length 150mm	P62				
Filling liquid (data always necessary) [1]							
Silicone oil			074				
Carbon fluoride			687				
Vegetable oil (suitable for the use in the food and beverage industry)			673				
High-temperature oil (not for directly connection, Code-No. 699)			663				
Vacuumproof Design			739				
Lengths of capillary tube (standard lengths)							
1 m			755				
2 m			757				
4 m			759				
6 m			760				
8 m			761				
11 m			762				
16 m			773				
Special lengths between 1m and 16m:							
Basic price of the next longer standard length plus an extra fee			764				
Special features							
Diaphragm with FEP-coating			662				
(for Mat’l 316 L st.st. (1.4404) and Hastelloy C, medium temperature ≤ 150 °C)							
Capillary tube with PVC protective cover			775				
Ex-Design for “Zone 0" (only with Code-Nos. 557 or 558)			689				

Other variations regarding Pressure rating, Materials, Sealing surfaces, Filling liquids **on request**. For mounting from **Remote seals in “Sandwich”-construction** (additional blank flange required) **see Data Sheet 15-8.14 EN**.

The three-digit code numbers from the remote seal are added to the order number of the transmitter, separated by diagonal strokes.

[1] When mounted on an absolute or gauge pressure transmitter for measurement ≤ 500 mbar (abs.), the Vacuumproof design must be ordered.

Transmitter ASD 800 / ASD 810 with Attached Remote Seal for Gauge Pressure, Absolute Pressure and Level

In-Line Remote Seal DN 25...DN 80 / DN 1"... 3"				
Options	Code-Nr.			
Remote Seal Mounting [1]				
Direct mounting (**without** capillary tube)	699			
Mounting to pressure-measuring mechanism **with** capillary tube	754			
Pressure rating				
PN 6 .... PN 400 or				
Class 150 psi ...Class 2500 psi				
Connection acc. to DIN 2501 or ANSI B 16.5				
Diaphragm and Sealing surface, Material 316 Ti st.st. (1.4571)				
Nominal diameter — Sealing surface				
DN 25 / DN 1" — Form E (DIN 2526) / Form RF	740			
DN 40 / DN 1 1/2" — Form E (DIN 2512) / Form RF	741			
DN 50 / DN 2" — Form E (DIN 2526) / Form RF	742			
DN 80 / DN 3" — Form E (DIN 2526) / Form RF	743			
Diaphragm and Sealing surface, Material Hastelloy C				
Nominal diameter — Sealing surface				
DN 25 / DN 1" — Form E (DIN 2526) / Form RF	744			
DN 40 / DN 1 1/2" — Form E (DIN 2512) / Form RF	795			
DN 50 / DN 2" — Form E (DIN 2526) / Form RF	749			
DN 80 / DN 3" — Form E (DIN 2526) / Form RF	727			
Filling liquid [1]				
Silicone oil	074			
Carbon fluoride	687			
High temperature oil	663			
Vegetable oil	673			
Vacuumproof Design	739			
Lengths of capillary tube				
1 m	755			
2 m	757			
4 m (maximal lengths with DN 25 / ANSI 1")	759			
6 m (maximal lengths with DN 40 / ANSI 1 1/2")	760			
8 m (maximal lengths with DN 50 / ANSI 2")	761			
11 m	762			
16 m (maximal lengths with DN 80 / ANSI 3")	763			
Special lengths between 1m and 16m:				
Basic price of the next longer standard length plus an extra fee	764			
Special Features				
Capillary tube with PVC protective cover	775			
Other variations regarding Pressure rating, Materials, Sealing surfaces, Filling liquids **on request**.				

The three-digit code numbers from the remote seal are added to the order number of the transmitter, separated by diagonal strokes.

[1] When mounted on an absolute or gauge pressure transmitter for measurement ≤ 500 mbar (abs.), the Vacuumproof design must be ordered.

Fast Coupled Remote Seals DN 50 / DN 2"

Options			Code-No.				
Remote Seal Mounting [1]							
Direct mounting (**without** capillary tube)			699				
Mounting to pressure-measuring mechanism **with** capillary tube							
with Running Union acc. to DIN 11 851							
Nominal diameter	Pressure rating	Process wetted parts					
DN 50	PN 25	316 Ti st.st. (1.4571)	712				
DN 50	PN 25	Hastelloy C	713				
with Clamp-Connection							
Nominal diameter	Pressure rating	Process wetted parts					
DN 2"	PN 40	316 Ti st.st. (1.4571)	716				
DN 2"	PN 40	Hastelloy C	726				
Sealing ring (O-ring) (only in conjunction with running union acc. DIN 11 851)							
Buna (tmax = 120 °C)			714				
PTFE			715				
Filling liquid [1]							
Silicone oil			074				
Carbon fluoride			687				
Vegetable oil			673				
Vacuumproof Design			739				
Other variations regarding Pressure rating, Materials, Sealing surfaces, Filling liquids **on request**.							

The three-digit code numbers from the remote seal are added to the order number of the transmitter, separated by diagonal strokes.

[1] When mounted on an absolute or gauge pressure transmitter for measurement ≤ 500 mbar (abs.), the Vacuumproof design must be ordered.

Miniature Remote Seal

Options			Code-No.				
Remote Seal Mounting [1]							
Direct mounting (**without** capillary tube)			699				
with Spigot acc. to DIN 16 288 [2]							
Process connection	Pressure rating	Process wetted parts					
G 1 A	PN 600	316 Ti st.st. (1.4571)	708				
G 1 A	PN 600	Hastelloy C	710				
G 1 1/2 A	PN 600	316 Ti st.st. (1.4571)	709				
G 1 1/2 A	PN 600	Hastelloy C	711				
Filling liquid [1]							
Silicone oil			074				
Carbon fluoride			687				
Vegetable oil			673				
Vacuumproof Design			739				
Other variations regarding Pressure rating, Materials, Sealing surfaces, Filling liquids **on request**.							

The three-digit code numbers from the remote seal are added to the order number of the transmitter, separated by diagonal strokes.

[1] When mounted on an absolute or gauge pressure transmitter for measurement ≤ 500 mbar (abs.), the Vacuumproof design must be ordered.

Questionnaire 80/15-105-1 EN (page 1 of 2)

Measuring instruments with remote seals for measuring gauge pressure, differential pressure, flowrate and level

The information given in this questionnaire is binding for the technical design of measuring system. The HARTMANN & BRAUN AG can only guarantee satisfactory measurement results when exact and correct information is provided.

The questions identfied by ◯ will be answered by Hartmann & Braun.

☐ Company

☐ Location

☐ Customer number: ◯ H&B offer number:

☐ Measuring-point number: ◯ H&B contract number:

◯ Position number:

Level Measurement

	Measuring instrument with one remote seal (see Fig. 1)	Measuring instrument with two remote seals (see Fig. 2)
1 Medium to be measured _____		
2 Operating data of the medium to be measured which will be referred to for the calculation and design Temperatures Process pressure Density Density of the gas above the process Process variable (e.g. 0 ... 5m ≙ 0 ... 20mA)	t = _____ ° C ϱ_M = _____ kg/m³ _____ ≙ 0/4...20mA)	t = _____ ° C p = _____ bar ϱ_M = _____ kg/m³ ϱ_G = _____ kg/m³ _____ ≙ 0/4...20mA)
3 Elevation between remote seal and measuring instr. Instrument above the remote seal Instrument below the remote seal	a = + _____ m a = – _____ m	
4 Difference in elevation of the two remote seals		e = _____ m
5 Tank dimensions: Difference in height of levels Dimension: from lower remote seal up to lower level from lower remote seal up to upper level	c = _____ m b = _____ m d = _____ m	c = _____ m b = _____ m d = _____ m
6 Capillary tube length + (HP) side – (LP) side	_____ m	_____ m _____ m
7 Additional data Process temperature range Average ambient temperature at the measuring instr. Average ambient temperature at the capillary tube	t_M = from ..... to ..... ° C t_{uM} = _____ ° C t_{uK} = _____ ° C	t_M = from ..... to ..... ° C t_{uM} = _____ ° C t_{uK} = _____ ° C
8 Data of limits which for example can occur with cleaning processes or blowing through (not measuring operation) Temperature Pressure	t_{max} = _____ ° C t_{min} = _____ ° C p_{max} = _____ bar p_{min} = _____ bar	t_{max} = _____ ° C t_{min} = _____ ° C p_{max} = _____ bar p_{min} = _____ bar

Note: Remote seals with silicone oil (standard) may be mounted up to a maximum of 5m below the measuring instrument.

H_1 = lower level
H_2 = upper level

Fig. 1

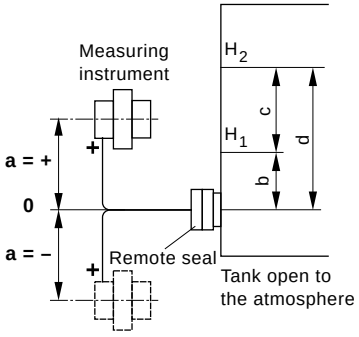
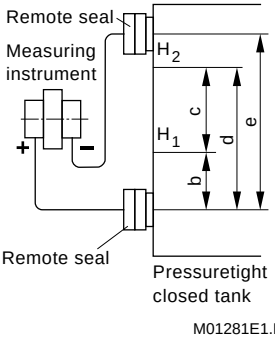


Fig. 2



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Questionnaire 80/15-105-1 EN (page 2 of 2)

Gauge pressure, Differential pressure and Flowrate Measurement

	Measuring instrument with one remote seal (see Fig. 3)	Measuring instrument with two remote seals (see Fig. 4)
1 Medium to be measured _____		
2 Operating data of the medium to be measured which will be referred to for the calculation and design Temperatures Process pressure Measuring span Differential pressure Density of the gas above the process Process variable (e.g. 0 ... 500mbar ≙ 0 ... 20mA)	 t = _____ ° C p = _____ bar △M = _____ bar ϱ M = _____ kg/m³ _____ ≙ 0/4...20mA	 t = _____ ° C p_1 = _____ bar p_2 = _____ bar △M = _____ bar △p = $p_1 - p_2$ = _____ bar ϱ M = _____ kg/m³ _____ ≙ 0/4...20mA
3 Elevation between remote seal and measuring instr. Instrument above the remote seal Instrument below the remote seal	 a = + _____ m a = – _____ m	
4 Difference in elevation of the two remote seals		e = _____ m
5 Capillary tube length + (HP) side – (LP) side	 _____ m	 _____ m _____ m
6 Additional data Process temperature range Average ambient temperature at the measuring instr. Average ambient temperature at the capillary tube	 t_M = from ..... to ..... ° C t_{uM} = _____ ° C t_{uK} = _____ ° C	 t_M = from ..... to ..... ° C t_{uM} = _____ ° C t_{uK} = _____ ° C
7 Data of limits which for example can occur with cleaning processes or blowing through (not measuring operation) Temperature Pressure	 t_{max} = _____ ° C t_{min} = _____ ° C p_{max} = _____ bar p_{min} = _____ bar	 t_{max} = _____ ° C t_{min} = _____ ° C p_{max} = _____ bar p_{min} = _____ bar

Note: Remote seals with silicone oil (standard) may be mounted up to a maximum of 5m below the measuring instrument.

Fig. 3

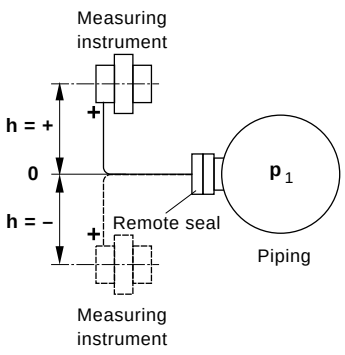
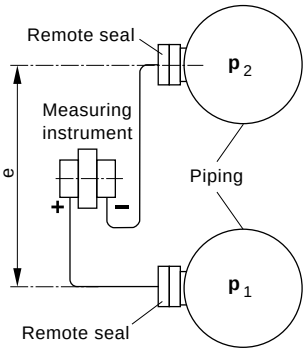


Fig. 4



e.g. also with filter measurements; in front of and behind the filter

Compiled: _____ , Date _____ 19 ____

Company stamp

_____
(Signature)

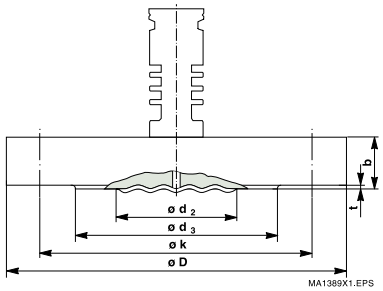
Flush Diaphragm Seal / Extended Diaphragm Seal
DN 50 / DN 2", DN 80 / DN 3" complete with Flange

Dimensional Diaphragm

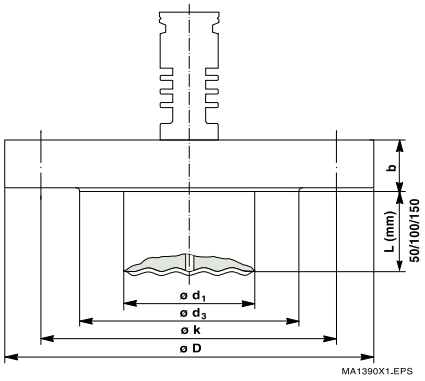
Sealin rings and fixing materials not supplied!

Directly Connected

● **Flush diaphragm remote seals**

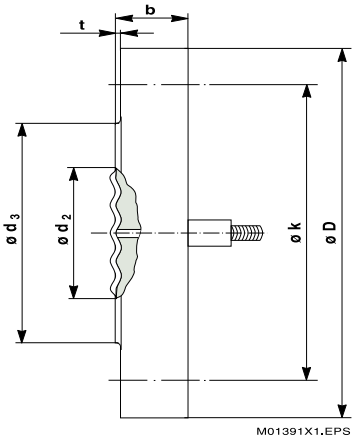


● **Extended diaphragm remote seals**

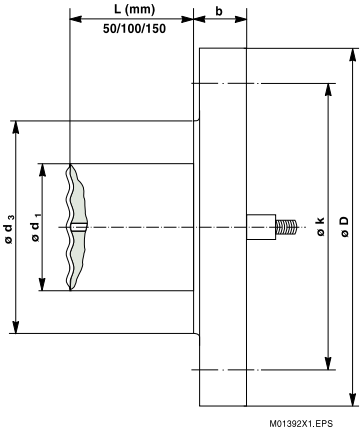


Mounting with Capillary Tube

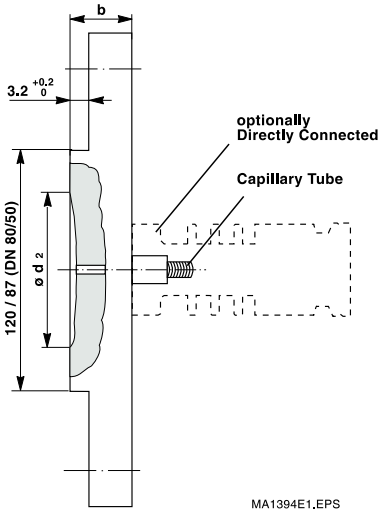
● **Flush diaphragm remote seals**



● **Extended diaphragm remote seals**



Form V13 Sealing Surface



Sealing Surfaces: Form E (DIN 2526), Form N (DIN 2512), Form RF (ANSI B16.5)

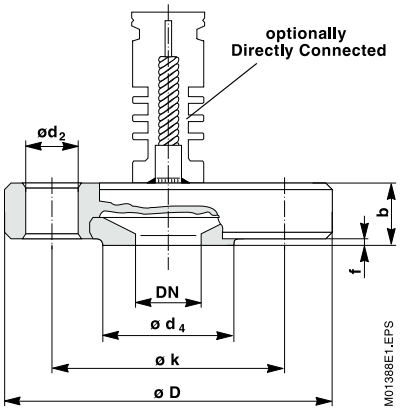
Nominal diameter DN	Pressure rating PN	⌀ D	⌀ k	Extension-⌀ d_1	⌀ d_2	⌀ d_3	t	b	Screws	
									Number	Thread
50	PN 16/40	165	125	51	57	102	$3^{+0.5}$	20	4	M 16
	PN 64	180	135	51	57	102	$3^{+0.5}$	26	4	M 20
	PN 100	195	145	51	57	102	$3^{+0.5}$	28	4	M 20
80	PN 16/40	200	160	76	75	138	$3^{+0.5}$	24	8	M 16
	PN 64	215	170	76	75	138	$3^{+0.5}$	28	8	M 20
	PN 100	230	180	76	75	138	$3^{+0.5}$	32	8	M 24
2'	class 150	152.4	120.6	51	57	92.1	$3^{+0.5}$	17.4	4	M 18
	class 300	165.1	127.0	51	57	92.1	$3^{+0.5}$	20.6	8	M 18
	class 600	165.1	127.0	51	57	92.1	6.35	31.75	8	M 18
3'	class 150	190.5	152.4	76	75	138	$3^{+0.5}$	22.2	4	M 16
	class 300	209.5	168.3	76	75	138	$3^{+0.5}$	27.0	8	M 20
	class 600	209.5	168.3	76	75	138	6.35	38.05	8	M 20

Flush Diaphragm Remote Seals DN 25 / DN 1", Miniature Remote Seals

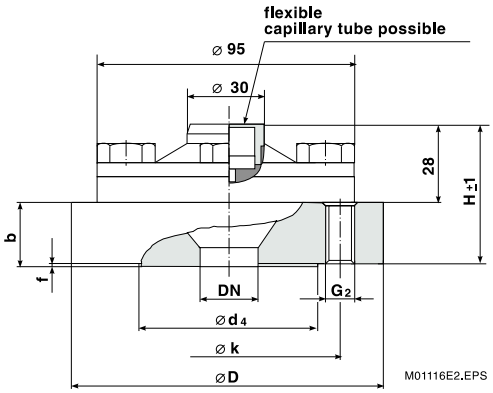
Dimensional Diagrams

Flush Diaphragm Remote Seals DN 25 / DN 1" with internal Diaphragm

PN 10/40 or Class 150 / 300



PN 63 ... 250 or Class 600 / 1500



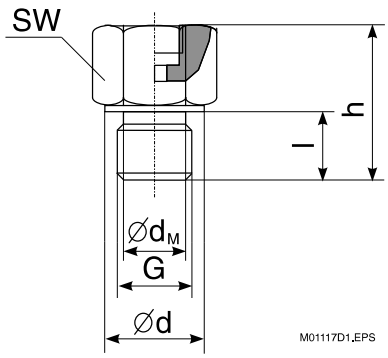
Connection acc. to DIN 2501

DN	PN	Dimensions in mm								Weight in kg
		D	k	d_4	b	f	H	d_2	G_2	
25	10 / 40	115	85	68	22	2	--	14	--	1.5
25	63 / 100	140	100	68	24	2	52	--	4xM16	3.2
	160	140	100	68	24	2	52	--	4xM16	3.6
	250	150	105	68	28	2	56	--	4xM20	4.0

Connection acc. to ANSI B 16.5

DN	Class	Dimensions in mm								Weight in kg
		D	k	d_2	d_4	b	f	H	G_2 UNC	
1"	150	110	79.5	16	51	22	2	--	--	1.4
	300	125	89	20	51	22	2	--	--	1.7
1"	600	125	89	--	51	25	7	53	4x5/8"	3.6
	1500	150	101.5	--	51	36	7	64	4x7/8"	4.0

Miniature Remote Seals

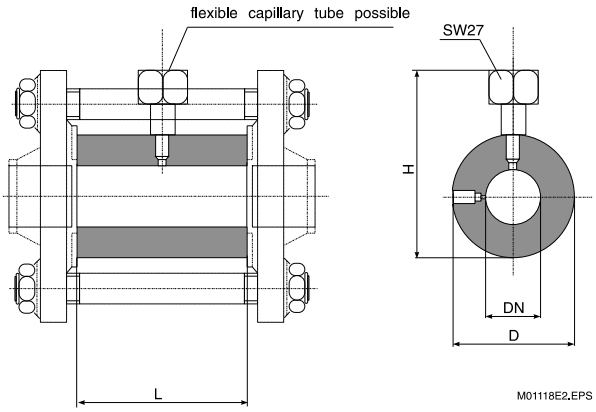


DN (G)	PN	Dimensions in mm					Weight in kg
		d_M	SW	d	l	h	
G 1 A	600	25	41	39	28	64	0.3
G 1 1/2 A	600	40	55	60	30	50	0.5

effective diaphragm diameter = d_M
SW = width across flats

Dimensional Diagrams

In-Line Remote Seals (witout flanges)



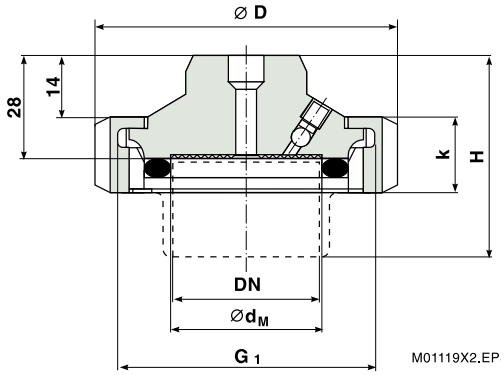
SW27 = width across flats 27mm

Connection acc. to DIN 2501 / acc. to ANSI B 16.5

DN in mm / inch	PN in bar / psi	Dimensions in mm			Weight in kg
		D	L	H	
25 / 1'	6...400 / 150...2500	63	60	110	1.4
40 / 1 1/2'	6...400 / 150...2500	85	60	132	2.2
50 / 2'	6...400 / 150...2500	95	60	187	2.5
80 / 3'	6...400 / 150...2500	130	60	222	4.0

Fast Coupled Remote Seals

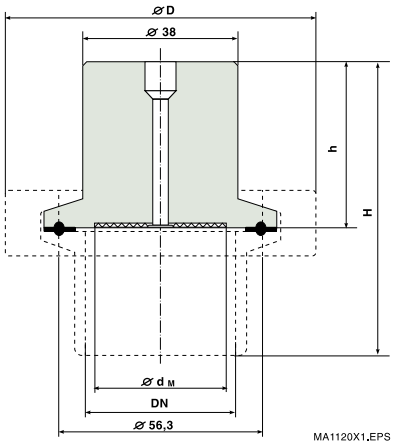
● with Running Union DN 50, PN_{max} 25



acc. to DIN 11 851

Dimensions in mm					Design	Weight in kg
d_M	D	$H_{ca.}$	k	G_2		
52	92	57	22	Rd 78 x1/6	Form D-F	0.8

● with Clamp-connection DN 2", PN_{max} 40

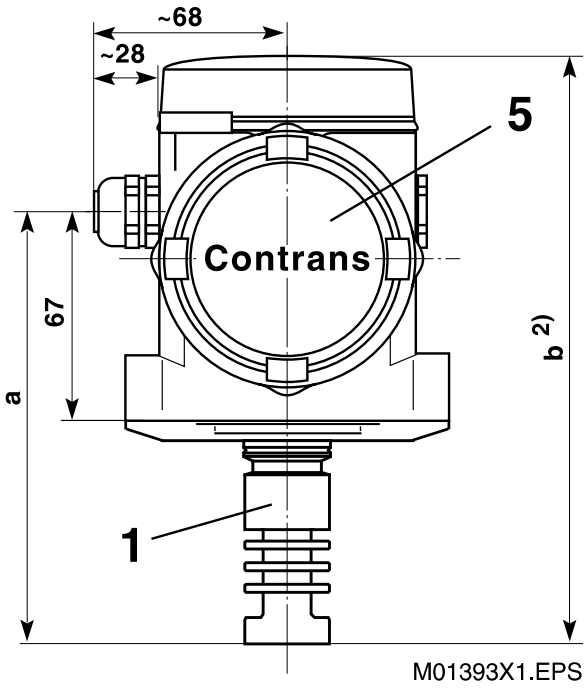


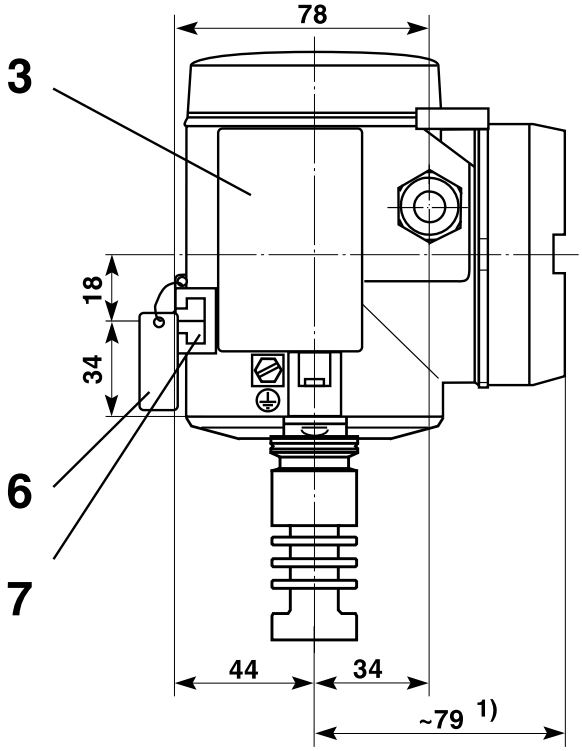
Dimensions in mm				Weight in kg
d_M	D	$H_{ca.}$	$h_{ca.}$	
40	75	58	35	0.75

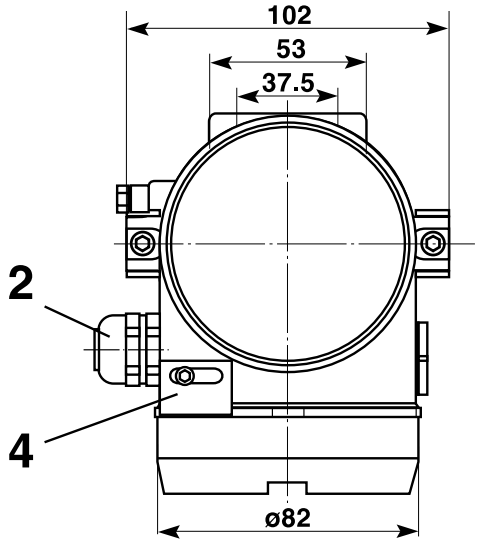
effective diaphragm diameter = d_M

Dimensional Diagrams

Errors and omissions excepted. All dimensions in millimeters (mm).







	Order No. V15956AE-... V15957AE-...	Order No. V15936AE-...
Dim. "a"	141 mm	148 mm
Dim. "b"	187 mm	194 mm

[2] With directly connected remote seal the length (height) of the remote seal must be added to dimensions "a" and “b” (see corresponding dimensional diagram).

1 Remote seal connection

2 Electrical connection:
Pg 13.5 cable gland or
two cable glands, one each on the righr and left or
1/2-14 NPT female threads on both sides or
one Han 8U plug.

3 Type plate

4 Locking excenter (only with EEx “d” - design)

5 Enclosure cover (electrical connection, connection for digital- / analogue indicating instrument)

6 Tie-on plate e.g. for tag number (option)

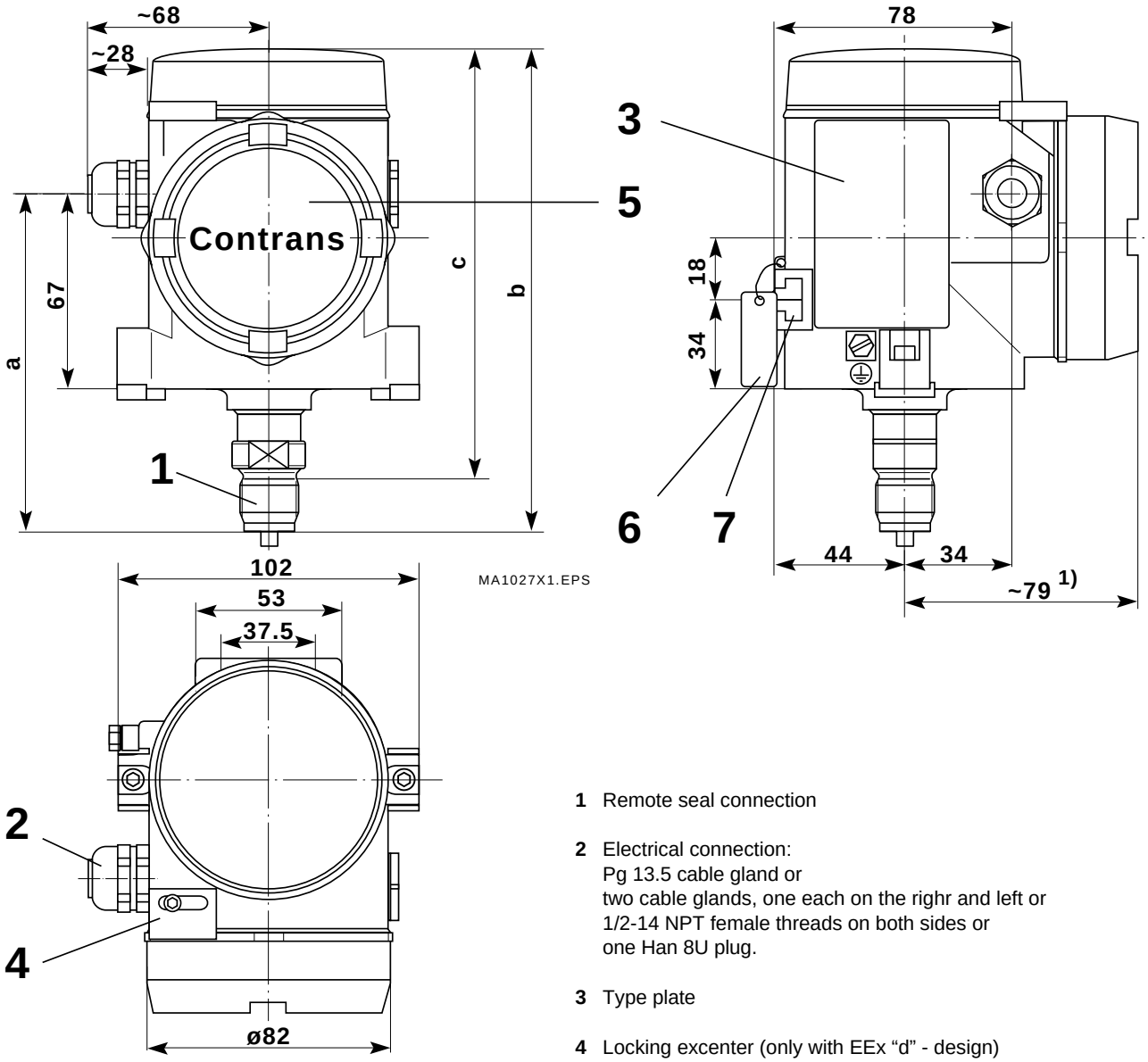
7 T-slot for screws when wall or pipe mounting

[1] With digital indicating instrument plus 29 mm.
With analogue indicating instrument plus 24 mm.

Transmitter ASD 800/ASD 810 for Miniature / In-Line Remote Seals and Flush Diaphragm Remote Seals DN 25 / DN 1" (up PN 63 / Class 600)

Dimensional Diagrams

Errors and omissions excepted. All dimensions in millimeters (mm).



	Order No. V15956AE-... V15957AE-...	Order No. V15936AE-...
Dim. "a"	124 mm	120 mm
Dim. "b"	169 mm	165 mm
Dim. "c"	151 mm	147 mm

With directly connected remote seal the length (height) of the remote seal must be added to dimension "c" (see corresponding dimensional diagram).

1 Remote seal connection

2 Electrical connection:
Pg 13.5 cable gland or
two cable glands, one each on the righr and left or
1/2-14 NPT female threads on both sides or
one Han 8U plug.

3 Type plate

4 Locking excenter (only with EEx “d” - design)

5 Enclosure cover (electrical connection, connection for digital- / analogue indicating instrument)

6 Tie-on plate e.g. for tag number (option)

7 T-slot for screws when wall or pipe mounting

1) With digital indicating instrument plus 29 mm.
With analogue indicating instrument plus 24 mm.

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