

Instrumentation free of dead pockets

Matrix piping, now encountered increasingly in the process technology industry, converts plant equipment into closed systems that prevent the operator from looking into his production process.

Control instruments and sensors are integrated into the system to maintain transparency in the production process. CIP/SIP cleaning and sterilization are on an equal footing with the actual functionality of instrumentation for applications in the brewing and beverage industries, in the milk processing industry as well as in the chemical, pharmaceutical and cosmetic industries.

In-Line control and measurement

The trademark VARINLINE® covers a whole family of control and measuring instruments for meeting CIP and SIP specifications, i.e. cleanability and sterilizability without dismantling.

The instruments can be cleaned and sterilized without any residue in automatic cleaning and sterilizing process cycles.

The heart of in-line control and measurement is the In-Line Access Unit, consisting of a through line with two sockets and two connections for instrumentation.

Key features of the In-Line Access Unit

- can be welded into the pipe circuit - no domes; no sumps
- sealed gap-free against the product by means of an O-ring
- connections for instrumentation independent of pipe diameters and process variables
- various pipe diameters in

Metric: Outside diameter acc. to DIN 11850, Row II, DIN 11866, Row A, 1.4404 / 316L

ISO: Outside diameter acc. to DIN EN ISO 1127, 1.4435 / 316L

Inch OD: Outside diameter to BS 4825 Part I, Outside diameter following ASME-BPE-a-2004, DIN 11866, Row C, 1.4404 / 316L

Inch IPS: Outside diameter acc. to IPS Sch. 5, 1.4404 / 316L

- access unit in CrNiMo steel
- rapid, accurate instrument fit using clamp ferrules
- possible to fit up to two different instruments on one in-line access unit

Transmitters for system optimization

The use of suitable blanking plates allows the In-Line Access Units to be installed into the pipe system gap-free and void of pockets, even without transmitters.

By installing these access units at critical locations in your system, it is then possible to retrofit instruments without welding. The plant user can optimize his system by quickly measuring the process pressure or installing a temporarily required sampling point. All that – as we mentioned before – without welding.

The following describes the VARINLINE® devices currently available. In order to emphasize the technological features of the VARINLINE® system, we have made a comparison with traditional methods using the example of pressure measurement.



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Example:

Pressure measurement

In principle, on the subject of pressure measurement in CIP/SIP systems one can say that sealing diaphragm systems have made their mark. Basically, we have to differentiate between 4 systems. The following brief description of system design serves to illustrate the distinguishing characteristics of each of the sealing diaphragms:

1. The flush sealing diaphragm with liner / groove nut as per DIN 11851

This system is used extensively throughout Europe. It is installed using male parts (as per DIN 11851) that are welded into the pipe system. As demonstrated in Fig. 1. the method produces dead space that cannot always be cleaned without residual accumulation.

2. The flush sealing diaphragm with the triclamp connection from the USA

This system is used extensively throughout America. It is installed in the pipe circuit in a similar way to that described above using a welding socket. It is, however, not fixed in place with a nut but with clamp ferrules. Dead space also results here, as with the previously described system.

3. Tube type sealing diaphragm

The tube type sealing diaphragm is ideal for CIP/SIP, as unlike the previously described systems, no dead space is created. However, the complete unit cannot simply be welded into a pipe circuit, but is usually supplied together with connecting elements such as IDF-unions.

4. The VARINLINE® sealing diaphragm

Clamp ferrules are used to install pressure sensors with sealing diaphragm in the In-Line Access Unit, which is welded into the pipe circuit. If you need to replace one of these instruments, you do not have to replace the complete section of piping, only the transmitter. For stocking purposes, you only need to consider measuring ranges and any special accessories, such as limit contacts. The pipe diameter can be ignored.

An additional feature is the low filling volume of the In-Line Access Unit thus providing a negligible influence on temperature.

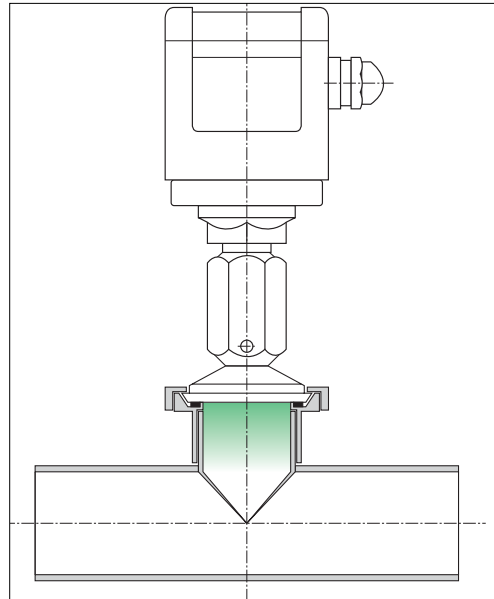


Fig. 1 Adaptation as per standard

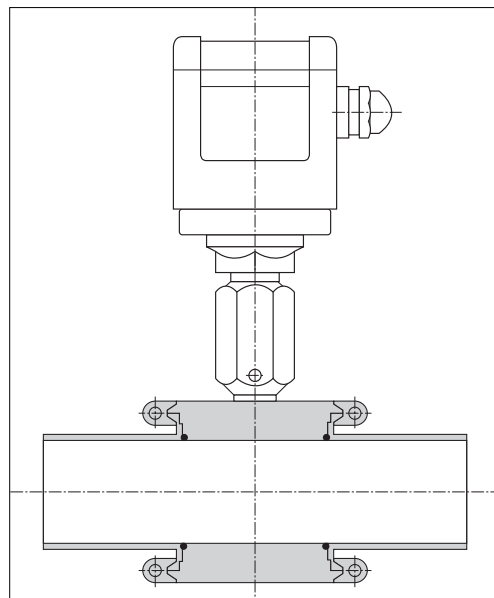
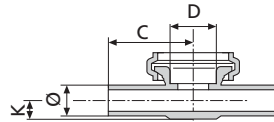
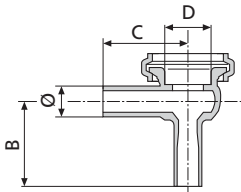


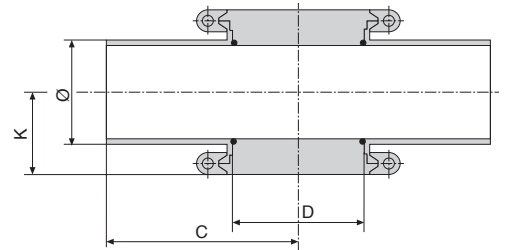
Fig. 2 VARINLINE® Adaptation

VARINLINE® Gehäuse
VARINLINE® Access Unit

B (DN 10/15, ISO 17,2/21,3)



F (DN 25, ISO 25, 1")
N (DN 40..., ISO 33,7..., 1 1/2" ...)



Metrisch Außendurchmesser nach DIN 11850, Reihe II, DIN 11866, Reihe A
Metric Outside diameter acc. to DIN 11850, Row II, DIN 11866, Row A

Nennweite Nominal Size	Ø	B	C	D	K
DN 10	13x1,5	40	65	31	34,5
DN 15	19x1,5	40	65	31	40,5
DN 25	29x1,5	-	90	50	30
DN 40	41x1,5	-	90	68	36
DN 50	53x1,5	-	90	68	42
DN 65	70x2	-	125	68	50
DN 80	85x2	-	125	68	57,5
DN 100	104x2	-	125	68	67
DN 125	129x2	-	125	68	79,5
DN 150	154x2	-	125/70	68	92

ISO Außendurchmesser nach DIN EN ISO 1127, 1.4435 / 316L
ISO Outside diameter acc. to DIN EN ISO 1127, 1.4435 / 316L

Nennweite Nominal Size	Ø	B	C	D	K
ISO 17,2	17,2x1,6	40	65	31	40
ISO 21,3	21,3x1,6	40	65	31	40
ISO 33,7	33,7x2	-	114,3	50	32
ISO 42,4	42,4x2	-	114,3	68	36,25
ISO 48,3	48,3x2	-	114,3	68	39,25
ISO 60,3	60,3x2	-	114,3	68	45,5
ISO 76,1	76,1x2	-	152,4	68	53,5
ISO 88,9	88,9x2,3	-	152,4	68	59,5
ISO 114,3	114,3x2,3	-	152,4	68	72

Zoll OD Außendurchmesser in Anlehnung an ASME-BPE-a-2004, DIN 11866, Reihe C
Inch OD Outside diameter following ASME-BPE-a-2004, DIN 11866, Row C

Nennweite Nominal Size	Ø	C	D	K
1"	OD 25,4x1,6	90	50	28
1 1/2"	OD 38,1x1,6	90	68	34,5
2"	OD 50,8x1,6	90	68	40,75
2 1/2"	OD 63,5x1,6	125	68	47
3"	OD 76,2x1,6	125	68	53,5
4"	OD 101,6x2	125	68	65,75

Zoll IPS Außendurchmesser nach IPS Sch. 5
Inch IPS Outside diameter acc. to IPS Sch. 5

Nennweite Nominal Size	Ø	C	D	K
2"	IPS 60,3x2	114,3	68	45,5
3"	IPS 88,9x2,3	152,4	68	59,5
4"	IPS 114,3x2,3	152,4	68	72
6"	IPS 168,3x2,8	152,4/70	68	98



Das VARINLINE® Gehäuse

Das Herzstück der In-Line Kontroll- und Messtechnik ist die Aufnahmemarmatur "In-Line Gehäuse" genannt. Hierbei handelt es sich hauptsächlich um ein zweistütziges Durchgangsgehäuse mit zwei seitlich angeordneten Geräteanschlüssen. Lediglich die Nennweite DN 10 / 15 und ISO 17,2 / 21,3 stellen hier eine Ausnahme dar. Je nach Gehäusenennweite und Einbautiefe der Instrumente ist es möglich bis zu zwei Geräte in der Armatur zu adaptieren.

The VARINLINE® Access Unit

The core piece of the in-line control and measurement technology is the process connection fitting, the "In-Line Access Unit". It is mainly a two-port straight-through housing with two lateral fittings for the connection of instruments. An exception are the nominal widths DN 10 / 15 and ISO 17.2 / 21.3. Depending on the nominal width of the In-Line Access Unit and the installation depth of the instruments, it is possible to incorporate two instruments maximum.

VARINLINE® Gehäuse VARINLINE® Access Unit

Die In-Line-Serie ist mit 3 Prozessanschlüssen lieferbar:

- Typ N** für VARINLINE® Gehäuse
DN 40 bis 150, ISO 42,4 bis 114,3 und 11/2" bis 6"
- Typ F** für VARINLINE® Gehäuse
DN 25, ISO 33,7 und 1"
- Typ B** für VARINLINE® Gehäuse
DN 10 / 15 und ISO 13,5 / 17,2 / 21,3

Beschreibung

- Aufnahme von VARINLINE® Kontroll- und Messgeräten gestattet tottraumfreien Einbau der Geräte
- Lichte Gehäusehöhe entspricht dem Innendurchmesser der Anschlussrohrleitungen
- VARINLINE® Gehäuse können direkt in Rohrleitungen eingeschweißt oder mit handelsüblichen Anschlussarmaturen ausgerüstet werden
- Anschluss von bis zu zwei unterschiedlichen VARINLINE® Kontroll- und Messgeräten an einem VARINLINE® Gehäuse
- Unbenutzte Prozessanschlüsse können mit Verschlussplatten blindgesetzt werden

Technische Daten

Werkstoff: 1.4404 / 316L
(1.4435 / 316L bei ISO)

Gehäuseoberflächen

- Standard: außen matt, innen $R_a \leq 0,8 \mu\text{m}$
außen matt, innen $R_a \leq 1,2 \mu\text{m}$ (nur IPS)
- Optional: innen $R_a \leq 0,8 \mu\text{m}$,
($R_a \leq 0,4 \mu\text{m}$ auf Anfrage),
elektropoliert

Dichtungswerkstoff nach 21 CFR Part 177.2600
(FDA konform)
Standard EPDM
optional FKM, HNBR

Rohranschlüsse

- Standard: Schweißstutzen
- Optional: handelsübliche
Flanschverbindungen

Die Gehäuse werden standardmäßig mit zwei Klappringen und O-Ringen geliefert.

Betriebsdruck

DN 10 – DN 50, ISO 17,2 - 48,3 und 1" - 2" 25 bar
DN 65 - DN 80 ISO 60,3 - 76,1 und 2 1/2" - 3" 16 bar
DN 100 - DN 150, ISO 88,9 - 114,3 und 4" - 6" 10 bar

Zertifikate

Werkszeugnis EN 10204-2.2
Abnahmeprüfzeugnis EN 10204-3.1

The in-line access units are available in three process connection types:

- Type N** for VARINLINE® access units
DN 40 to 150, ISO 42.5 to 114.3 and 11/2" to 6"
- Type F** for VARINLINE® access units
DN 25, ISO 33.7 and 1"
- Type B** for VARINLINE® access units
DN 10 / 15 and ISO 13.5 / 17.2 / 21.3

Description

- for pocket-free installation of VARINLINE® measuring and control instruments into pipe systems
- clear height of the in-line access unit corresponds to the inside diameter of the connecting pipe
- VARINLINE® access units may directly be welded into pipe systems or fitted with commercial connection fittings.
- for the connection of two different VARINLINE® measuring and control devices at one VARINLINE® access unit
- process connections without transmitter can be sealed with suitable blanking plates

Technical Data

Material: 1.4404 / 316L
(1.4435 / 316L only for ISO)

Finish

- Standard: outside matte, inside $R_a \leq 0.8 \mu\text{m}$
outside matte, inside $R_a \leq 1.2 \mu\text{m}$ (only for IPS)
- Options: inside $R_a \leq 0.8 \mu\text{m}$,
($R_a \leq 0.4 \mu\text{m}$ on request),
electro-polished

Sealing material as per 21 CFR Part 177.2600
(FDA approved)
Standard EPDM
optional FKM, HNBR

Pipe connections

- Standard: welding ends
- Options: commercially available
flange connections

The Access Units are supplied with two clamps and O-rings.

Operating pressure

DN 10 – DN 50, ISO 17,2 - 48,3 and 1" - 2" 25 bar
DN 65 - DN 80 ISO 60,3 - 76,1 and 2 1/2" - 3" 16 bar
DN 100 - DN 150, ISO 88,9 - 114,3 and 4" - 6" 10 bar

Certificates

Factory test certificate EN 10204-2.2
Certificate EN 10204-3.1