

Flowmeter

COVOL



OVERVIEW

Operation

- Oscillating piston

Application

- Consumption measuring
- Dosing and mixing
- Filling of tanks and other containers
- Petrochemical industry

Features

- Universal orientation
- Bi-directional flow measurement
- High accuracy
- Easy cleaning
- Used for viscosities up to 120000 mPas (cP)
- EX-version according to ATEX directive available
- Flange connection in accordance with EN 1092-1
- Optional thread connecting

Options:

- Analog transmitter with display
- Totalizer with display
- Frequency divider
- Electrical converter with display

Installation information

- The operating instructions for COVOL must be observed!
- **Download: www.meister-flow.com**

■ OPERATING DATA

Operating pressure, max.	PN 10 (Plastic version) PN 16 (Stainless steel version)
Pressure drop	see diagram on page 6
Media temperature	
PVC version	0 °C - 45 °C
PP version	-10 °C - 80 °C
PTFE version	-20 °C - 130 °C
Stainless steel version	-40 °C - 150 °C
Viscosity	≤ 120000 mPas (cP)
Measuring accuracy	±0,8 % of measured value
Repeatability	±0,3 % of measured value

Changed operating data apply for EX-version in accordance with ATEX-Directives!

The Operating Instructions for COVOL and the applicable Declarations of Conformity must be observed.

Download: www.meister-flow.com

■ MEASURING RANGES

Type	Flow	Temporary	Pulse rate
		max.	
COVOL-H ⁽¹⁾	10	25 – 250	500
COVOL	10	40 – 350	800
COVOL	15	150 – 1500	2700
COVOL	25	500 – 4500	9000
COVOL	40	800 – 8500	15500
COVOL	50	1500 – 16000	28000
COVOL	80	3000 – 28000	50000
COVOL	100	5000 – 60000	104000
			0,2

⁽¹⁾ DN 10 / 1/4", horizontal installation only

The flowmeters are calibrated with water (density 1.00 kg/dm³, viscosity 1mPas). The pulse rate (pulse per liter) is then established and recorded on the device.

Using this value, the transmitter can then calculate the flow rate and / or volume per time interval.

The maximum measurement accuracy is achieved in the middle of the respective measuring range (refer to table on page 6).

An altered viscosity can lead to changes in the pulse rate. Changes in density, compared to the calibration medium, generally affects only the beginning of the specified measuring range. With a higher density, the signal output starts at a lower flow rate; and with lower density it begins at a higher flow rate. In both cases, the measurement range changes maximally by 5% relative to the measured reference medium value.

At viscosities of more than 1000 mPas, the measuring range may change significantly.

■ MATERIALS

see table on page 3

■ OPTIONS

See pages 8 to 11

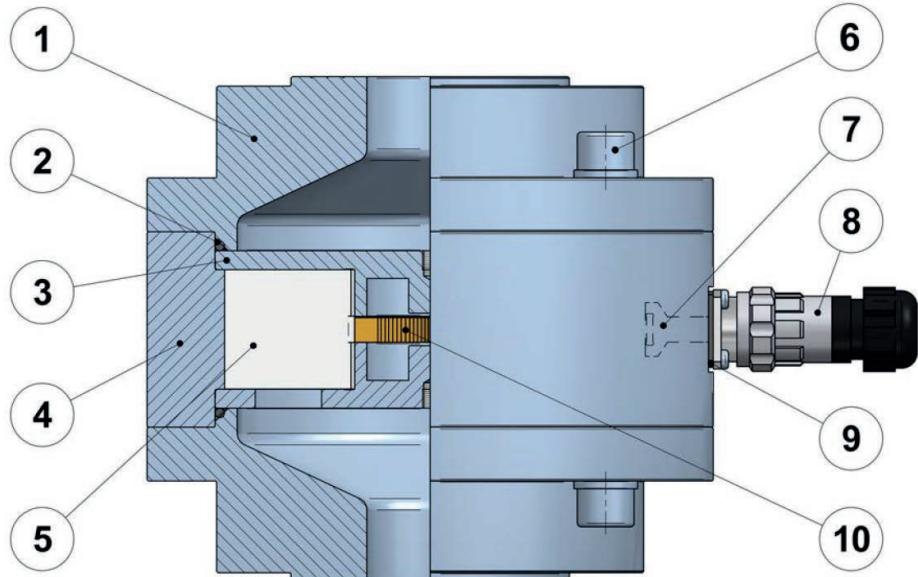
CP 420 Analog transmitter, 4 - 20 mA, with display and counter

CIP, CIP II Battery powered counter with display

ADF60V Explosion-proof housing for CP 420L, CIP or CIP II

Further accessories on request

■ ASSEMBLY DRAWING

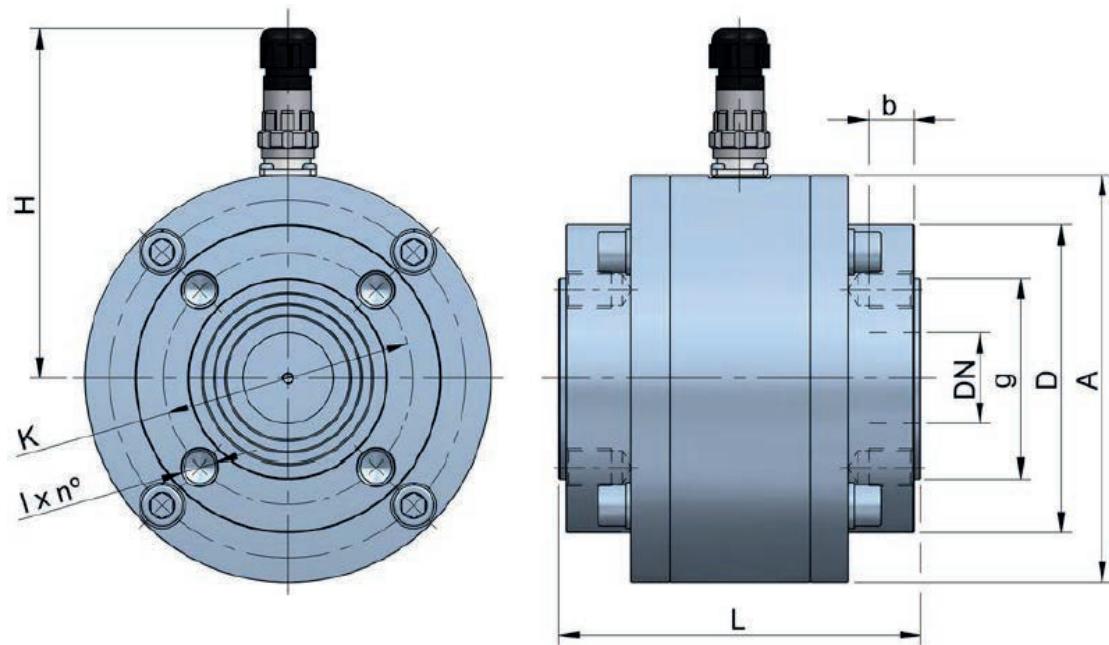


■ MATERIALS / PARTS DESCRIPTION

Version

Item	Description	Material	
		Stainless steel version	PTFE, PVC and PP version
1	Inlet / outlet chamber + connection:	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
2	O-ring:	NBR / PTFE / EPDM / FKM	NBR / PTFE / EPDM / FKM
3	Guide disk:	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
4	Measuring chamber:	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
5	Separator:	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
6	Screws:	EN 1.4401 (AISI 316)	EN 1.4401 (AISI 316)
7	Reed contact:		
8	Connector:	Aluminum alloy + Polyamide	Aluminum alloy + Polyamide
9	Gasket:	NBR	NBR
10	Piston:	PTFE + Graphite / Bronze / Aluminum	PTFE + Graphite / Bronze / Aluminum

■ TECHNICAL DRAWING



■ SUMMARY OF TYPES

Flange connection in accordance to EN 1092-1, Stainless steel version

Type	Overall dimensions [mm]							
	DN	D	g	K	(I x n°) x b	L	A	H
COVOL	10	77	40	60	(M12 x 4) x 15	90	100	110
COVOL	15	84	45	65	(M12 x 4) x 15	110	110	115
COVOL	25	107	68	85	(M12 x 4) x 15	120	140	135
COVOL	40	135	88	110	(M16 x 4) x 20	150	180	155
COVOL	50	154	102	125	(M16 x 4) x 20	180	200	165
COVOL	80	200	138	160	(M16 x 8) x 20	200	250	190

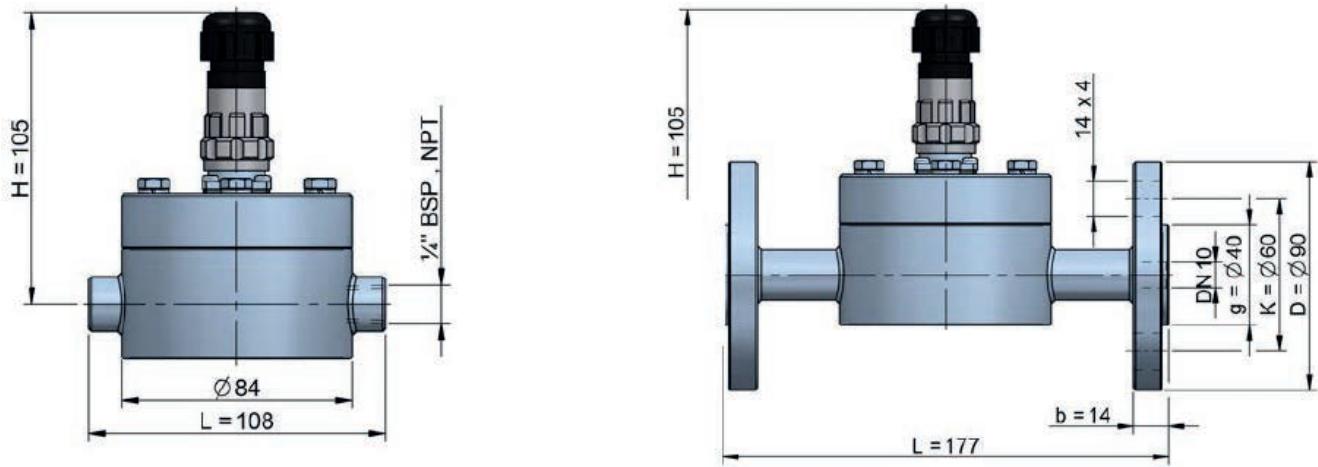
DN 100 on request (special version)

Flange connection in accordance to EN 1092-1, PTFE-, PVC- and PP version

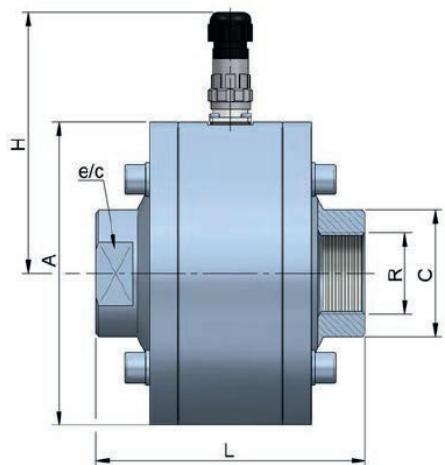
Type	Overall dimensions [mm]							
	DN	D	g	K	(I x n°) x b	L	A	H
COVOL	10	90	40	60	(M12 x 4) x 18	100	115	120
COVOL	15	95	45	65	(M12 x 4) x 20	125	125	130
COVOL	25	115	68	85	(M12 x 4) x 25	140	150	140
COVOL	40	145	88	110	(M16 x 4) x 25	160	180	155
COVOL	50	160	102	125	(M16 x 4) x 25	195	200	165
COVOL	80	200	138	160	(M16 x 8) x 25	235	250	190

■ TECHNICAL DRAWING

Type COVOL-H / DN 10 / 1/4", Flange- or threaded connection, horizontal installation



■ THREAD CONNECTION BSP / NPT



Type	Overall dimensions [mm]						
	DN	R ⁽²⁾	C	e/c	L	A	H
COVOL	10	1/4"	36	32	90	100	110
COVOL	15	1/2"	42	36	110	110	115
COVOL	25	1"	60	55	120	140	135
COVOL	40	1 1/2"	75	65	150	180	155
COVOL	50	2"	90	80	180	200	165
COVOL	80	3"	125	115	200	250	190

⁽²⁾ Other sizes on request

Hygienic process connections on request!

■ DIAGRAMS

Diagram 1: Pressure drop for water is dependant on the flow

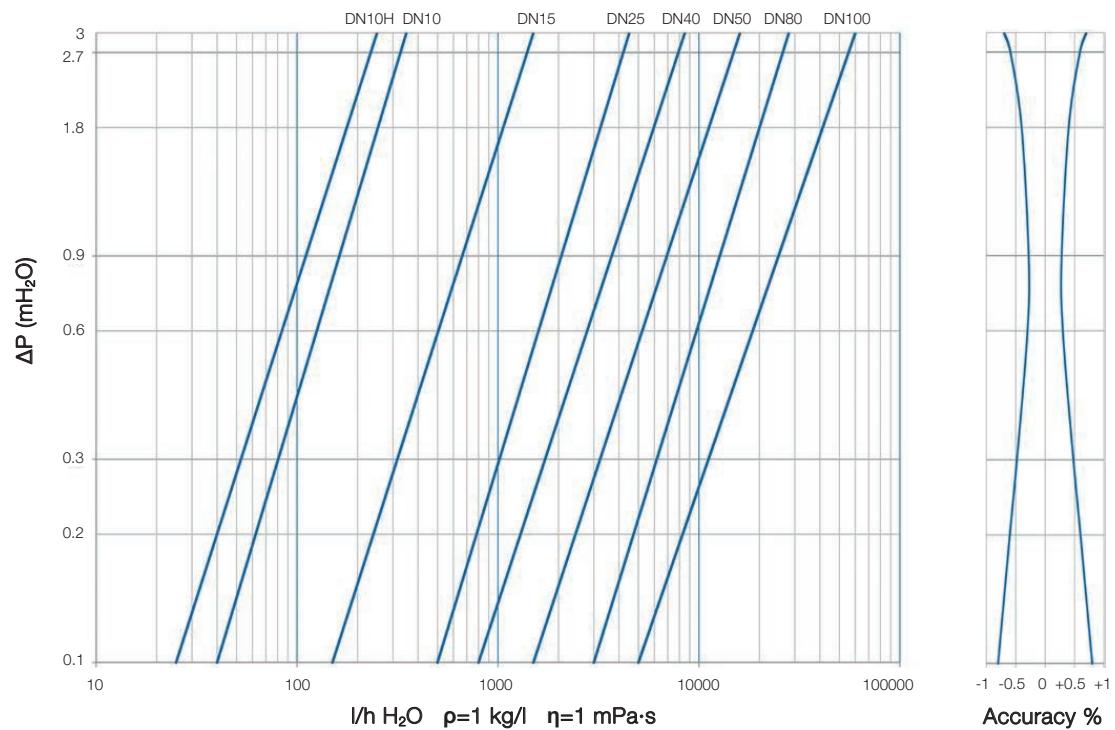
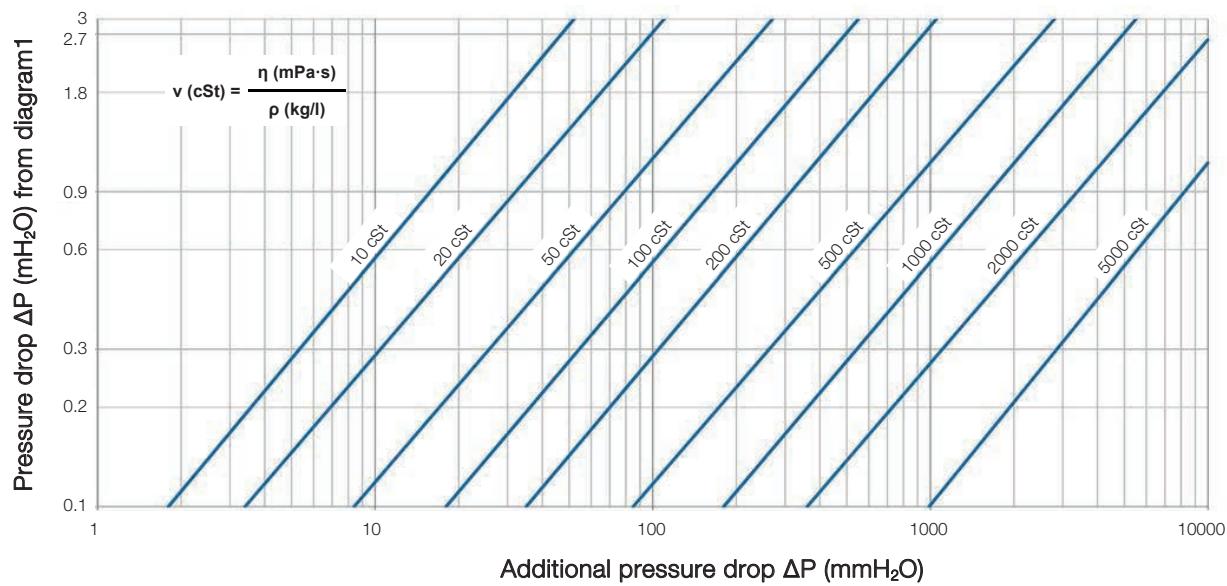
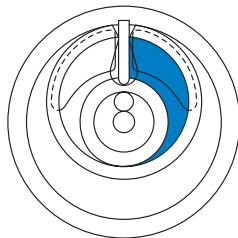


Diagram 2: Additional pressure drop (mmH₂O) is dependent on the kinematic viscosity (cSt)

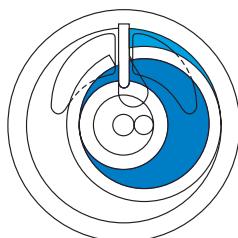


■ FUNCTIONAL PRINCIPLE



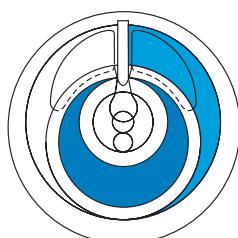
Position 1

The liquid flows into the inside of the ring piston and starts the rotation.



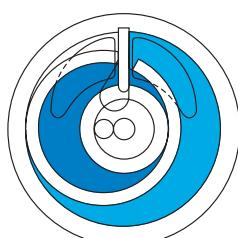
Position 2

The liquid starts to fill the cavity between metering chamber and the outside of the piston and continues to fill the inside of the piston.



Position 3

The piston is completely filled. The liquid continues to fill the outside cavity and keeps the piston in motion.



Position 4

During further filling of the cavity, the inside of the piston will be discharged through the outlet.
A new cycle begins as the liquid flows into the inside of the ring piston.

■ OPTIONS, ELECTRONIC

■ CP420

Analog transmitter with display and counter

2-wire system (loop powered)

3 housing versions

Housing versions

CP420L

Compact design
aluminum base with
UV-resistant polycarbonate cover
IP 65

CP420R

Separate version
for installation on DIN rail
IP 30

CP420P

Separate version
for panel mounting,
front IP 50, rear IP 30

Power supply

8...36 V DC

Power consumption

≤ 20 mA

Output

4 - 20 mA

Totalizer (volume)

7 digit display, height 8 mm,
reset via keyboard,
several measuring units selectable

Flow rate display

5 digit, height 5 mm,
programmable measuring range
limits
several measuring units selectable

Pulse rate

programmable correction factor
(pulses per liter)

Ambient temperature

0 °C - 60 °C

CP420L



CP420R



CP420P



CIP, CIP II

Battery powered totalizer with display

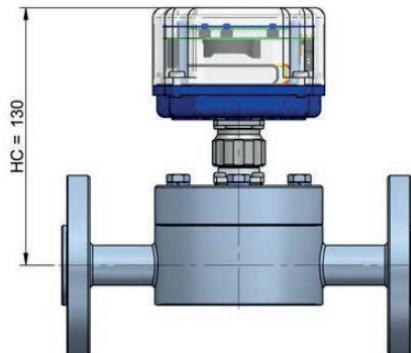
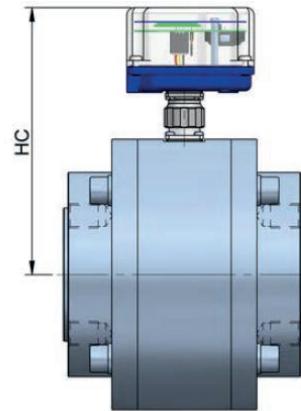
CIP	Resettable totalizer (total volume)
CIP II	Non-resettable totalizer (total volume) + resettable partial volume totalizer
Housing	Aluminum base with UV-resistant polycarbonate cover IP 65 Compact design
Power supply	3 V DC
Battery	CR-2450, 3 V, 560 mAh Button cell battery 24,5 x 5,0 mm
Power consumption	8 µA
Battery life	approx. 5 years
Totalizer (total volume)	7 digit display, height 8 mm, reset (not with CIP II) via push-button or external magnet
Totalizer (partial volume)	only with CIP II, 5 digit, height 5 mm reset via push-button or external magnet
Pulse rate	programmable correction factor (pulses per liter)
Ambient temperature	0 °C - 60 °C

CIP II with COVOL



TECHNICAL DRAWING

COVOL + CIP / CIP II / CP420L



Type	Overall dimensions [mm]		
	DN	HC ⁽³⁾	HC ⁽⁴⁾
COVOL-H 10	10	130	130
COVOL 10	10	135	145
COVOL 15	15	140	155
COVOL 25	25	160	165
COVOL 40	40	180	180
COVOL 50	50	190	190
COVOL 80	80	215	215

⁽³⁾ Devices in Stainless steel version

⁽⁴⁾ Devices in PTFE-, PVC- and PP-version

■ ATEX VERSION

The COVOL flowmeter is suitable for installation in hazardous areas according to ATEX Directive, i.e. in areas where an explosive atmosphere can be created. There are two types of protection available:

Exi (intrinsic safe)
Exd (pressure proof encapsulation)

Ignition protection type Exia

The Reed contact is considered as "simple equipment" under EN 60079-11, Section 5.7, since it contains no separate ignition source.

Technical data for the Reed-contact:

- Vmax.: 30 V ; Imax.: 20 mA
- Max. Contact rating: 0.6 VA
- Max. ambient temperature: 40 °C

According to this data, the flowmeter can be installed in hazardous areas if a suitable Zener barrier is installed between the hazardous and safe area. The electronic converters must always be installed in the safe area.

Ignition protection type Exd

These devices comply with Directive 94/9 / EC (Equipment and protective systems intended for use in potentially explosive atmospheres), as indicated in the certificate LOM 14ATEX and in the associated identification marking and labeling.

The device belongs to Group II and is therefore intended for use in areas where the risk of formation of an explosive atmosphere exists, except in mining.

As device in category 2GD, it can be employed in areas where it can be expected that an explosive atmosphere of gases, vapors, mists or air / dust mixtures may occasionally occur.

- Type ADF60V: Housing with sight glass, employment with CIP, CIP II and CP420L

Technical data for Exd version:

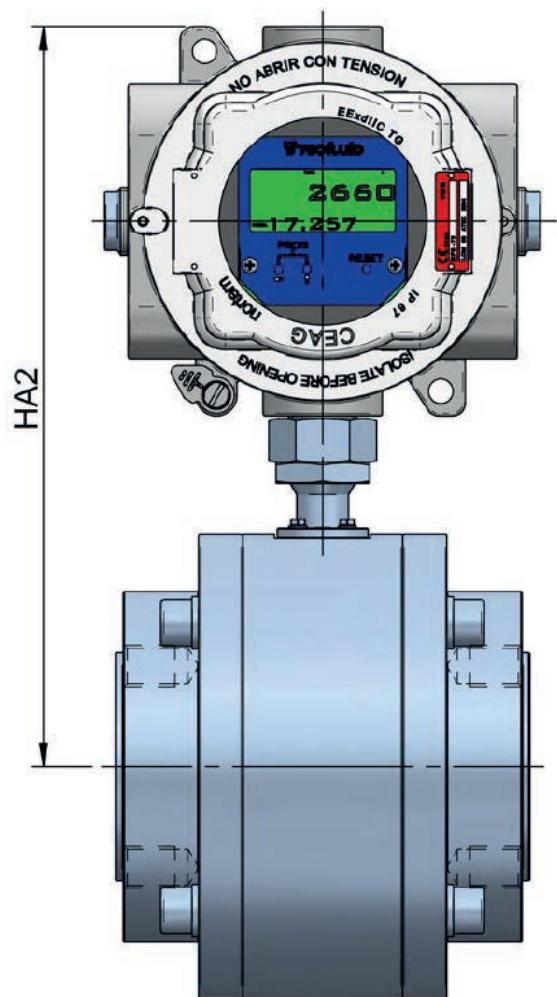
- Ambient temperature: -20 °C - 60 °C
- Electrical wiring inside the Exd housing
- On request ATEX cable glands for standard cable and shielded cable
- Associated electronics for the series:
CIP / CIP II: Battery-operated volumetric meter
CP420: Transmitter 2-wire system, with flow display, totalizer and 4 - 20 mA output
- ATEX Certificate Ex d IIC T6 Gb / Ex tb IIIC T85°C Db

Exd-housing ADF60V with CIP II



TECHNICAL DRAWING

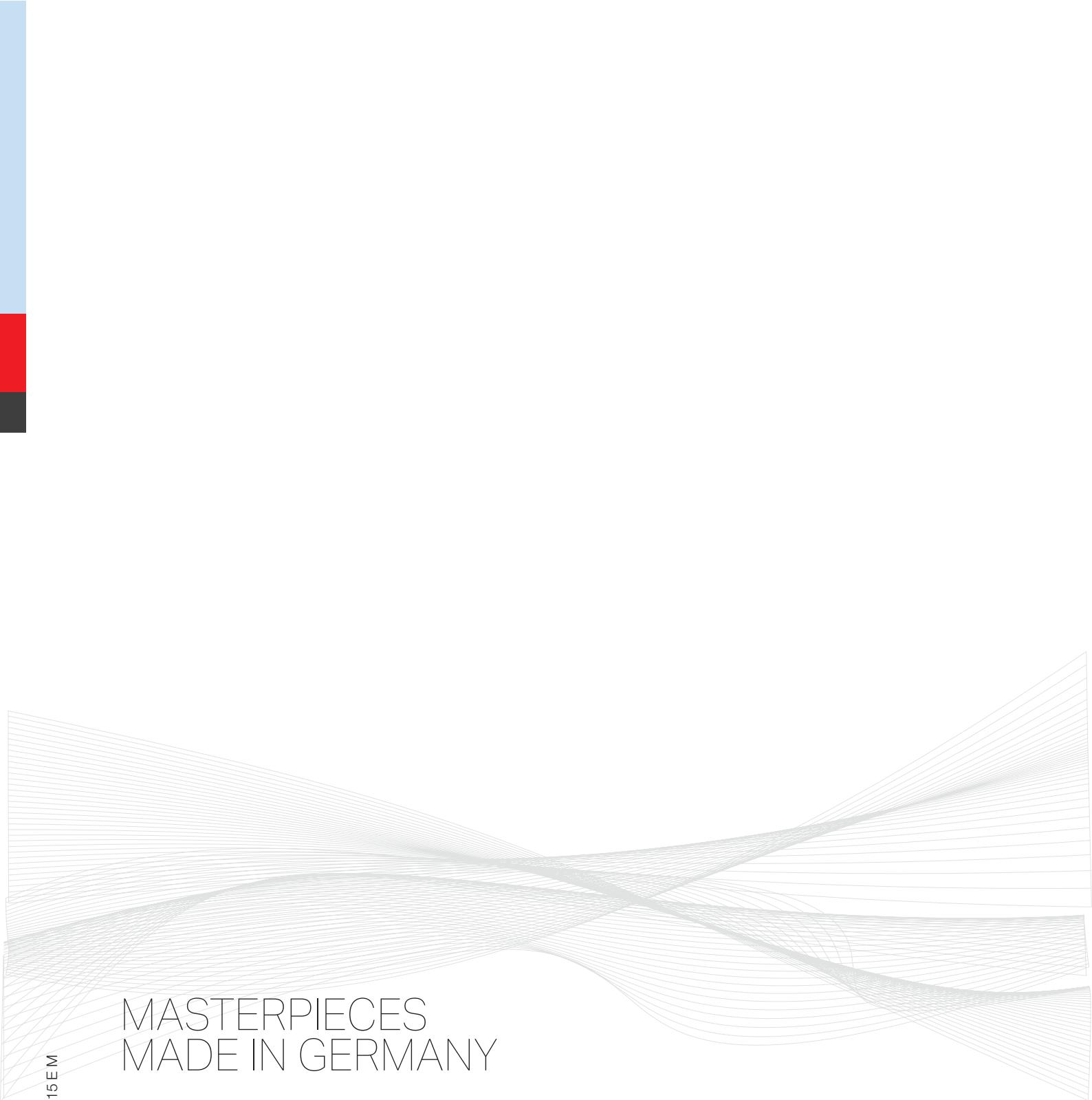
Exd-housing, Type ADF60V



Type	Overall dimensions [mm]	
	DN	Stainless steel
COVOL	15	250
COVOL	25	270
COVOL	40	290
COVOL	60	300
COVOL	80	325

Exd-housing not available for DN 10

DN 100 on request



MASTERPIECES MADE IN GERMANY

COVOL 12 0001 12-15 EM

Meister Strömungstechnik GmbH • Im Gewerbegebiet 2 • 63831 Wiesen / Germany
Tel. +49 (0) 6096 9720-0 • Fax +49 (0) 6096 9720-30 • sales@meister-flow.com • www.meister-flow.com
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