

INSTRUCTION

for

EMCO Meter Run plate with carrier rings

type CompaQ

Liquid, gas, and steam

Application

EMCO meter run with carrier rings is the primary element in liquid, gas or steam flow measurement according to the differential pressure principle. The fluid must be in one phase and the pipe shall run full in the measuring section. Changes of flow shall be slowly i.e. without pulsation.

Storage

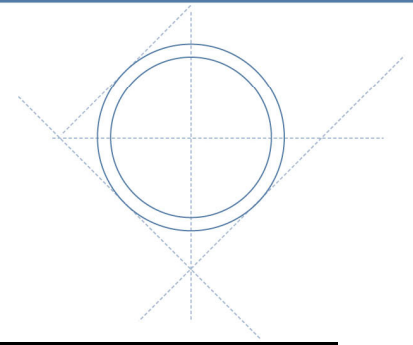
Before installation the primary element must be kept clean and protected against corrosion and physical damage. Careful attention to the sharp edge of the orifice plate is important.

Pipe Run

The EMCO meter run with carrier rings shall be fitted between 2 sections of straight cylindrical pipe of constant cross-sectional area without any obstructions.

The required minimum straight lengths of pipe vary according to beta and the nature of obstruction - bends, reducers etc. From the table below it can be seen how many times the inner pipe diameter D is required for "zero additional uncertainty"

The values in the brackets give "+/-0,5% additional uncertainty". These are applicable when the length of the straight pipe run is between the unbracket and the bracket values. If the straight lengths are shorter than the bracketed values no information is available of the value of any further uncertainty.



β	On upstream (inlet) side of the primary device							On downstream (outlet) side
	Single 90° bend or tee (flow from one branch only)	Two or more 90° bends in the same plane	Two or more 90° bends in different planes	Reducer (2 D to D over a length of 1,5 D to 3 D)	Expander (0,5 D to D over a length of 1 D to 2 D)	Globe valve fully open	Gate valve fully open	All fittings included in this table
≤ 0,20	10 (6)	14 (7)	34 (17)	5	16 (8)	18 (9)	12 (6)	4 (2)
0,25	10 (6)	14 (7)	34 (17)	5	16 (8)	18 (9)	12 (6)	4 (2)
0,30	10 (6)	16 (8)	34 (17)	5	16 (8)	18 (9)	12 (6)	5 (2,5)
0,35	12 (6)	16 (8)	36 (18)	5	16 (8)	18 (9)	12 (6)	5 (2,5)
0,40	14 (7)	18 (9)	36 (18)	5	16 (8)	20 (10)	12 (6)	6 (3)
0,45	14 (7)	18 (9)	38 (19)	5	17 (9)	20 (10)	12 (6)	6 (3)
0,50	14 (7)	20 (10)	40 (20)	6 (5)	18 (9)	22 (11)	12 (6)	6 (3)
0,55	16 (8)	22 (11)	44 (22)	8 (5)	20 (10)	24 (12)	14 (7)	6 (3)
0,60	18 (9)	26 (13)	48 (24)	9 (5)	22 (11)	26 (13)	14 (7)	7 (3,5)
0,65	22 (11)	32 (16)	54 (27)	11 (6)	25 (13)	28 (14)	16 (8)	7 (3,5)
0,70	28 (14)	36 (18)	62 (31)	14 (7)	30 (15)	32 (16)	20 (10)	7 (3,5)
0,75	36 (18)	42 (21)	70 (35)	22 (11)	38 (19)	36 (18)	24 (12)	8 (4)
0,80	46 (23)	50 (25)	80 (40)	30 (15)	54 (27)	44 (22)	30 (15)	8 (4)

For all β values	Fittings	Minimum upstream (inlet) straight length required
	Abrupt symmetrical reduction having a diameter ratio $\geq 0,5$	30 (15)
	Thermometer pocket or well of diameter $\leq 0,03 D$ Thermometer pocket or well of diameter between $0,03 D$ and $0,13 D$	5 (3) 20 (10)

It is recommended to use full bore valves upstream the primary element. The valves shall be fully open.

Installation

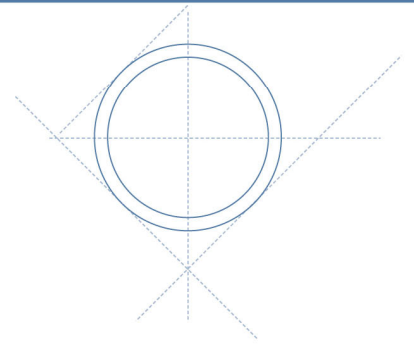
Gas and steam

It is recommended to install the differential pressure transmitter above the meter run for gas applications.

The CompaQ can only be used for steam flow measurement in a horizontal pipe run in conjunction with a condensing camber unit.

When the primary element is installed in a horizontal pipe measuring a flow which tends to condensate the orifice plate is provided with a drain hole to let the liquid pass the orifice plate.

The drain hole must be at the bottom of the pipe.



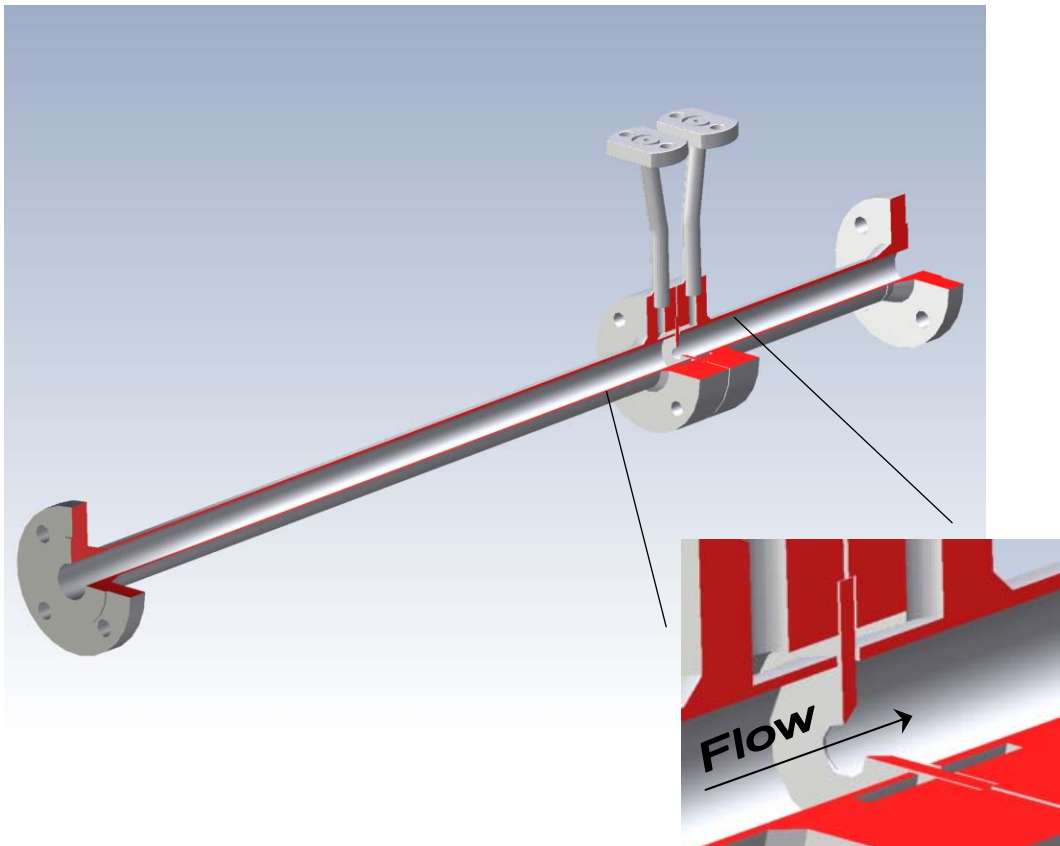
Liquid

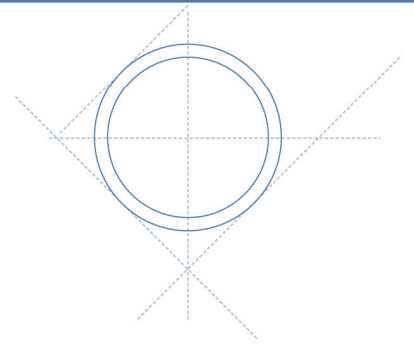
It is recommended to install the differential pressure transmitter underneath the meter run for liquid .

If a liquid in a flow measurement tends to form a gas the orifice plate is provided with a vent hole to let the gas pass the orifice plate.
The vent hole must be in the top of the orifice plate.

The bevelled side of the orifice plate is the downstream side.

Flange gaskets must suit the fluid and the service conditions.
The inner diameter of the flange gaskets must be greater than the inner pipe diameter.





Instrument Connection

The differential pressure transmitter/manifold valve is mounted on the 2 transmitter mounting flanges.

The " + " side of the meter run is connected to the " + " side of the differential pressure transmitter and the two " - " sides are connected.

It is recommended to use a 3-way manifold valve in connection with the differential pressure transmitter in order to isolate and equalise the transmitter.

In case that the CompaQ is mounted vertically the differential pressure transmitter need to be zeroed.

Maintenance

The EMCO meter run with carrier rings requires no special maintenance. It is however important that the sharp edge of the orifice remains sharp and that the meter run are free from deposits .

References

ISO 5167, DIN 1952, DIN 19205 part 1, DIN 19207, DIN 19208, DIN 19209, DIN 19210, DIN 19211, DIN 19216, Shell Flow Meter Engineering Handbook, Flow Measurement Engineering Handbook.