

# RAY FS WS 453/455

MECHANICAL FLOW SENSOR

**DIEHL**  
Metering



## APPLICATION

Volume measuring device to measure thermal quantities

## FEATURES

- ▶ Possibility of remote transmission of quantities of flow
- ▶ For easy reading the complete head part with totalizer can be turned to any position
- ▶ Easily removeable reed-switch
- ▶ The pulse transmitter is fitted with a 100  $\Omega$ , 1/4 W series resistor (cable length 3 m) - can be supplied without series resistor on request
- ▶ Contact load (without series resistor) max. 24 V AC/DC (protective low voltage) 0.2 A
- ▶ Outstanding continuance of accuracy even with extreme charges because of vane bearing bearing of ring sapphire and carbide metal
- ▶ Considerably extended measuring range towards small flows compared to documentation of metrological class
- ▶ As a safeguard against magnetic influences, a sealable antimagnetic screen is fitted on the meter
- ▶ Approved according MID in class 2 and 3
- ▶ Completely dry-running

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## MECHANICAL FLOW SENSOR

### GENERAL

| RAY FS WS 453/455        |                          |            |                 |
|--------------------------|--------------------------|------------|-----------------|
| Application              | Heating                  |            |                 |
| Mounting position        | Horizontal               |            |                 |
| Medium temperature range | °C                       | 15 ... 105 |                 |
| Ambient temperature      | °C                       | 5 ... 55   |                 |
| Ambient class            | E1 + M1                  |            |                 |
| Nominal pressure         | PN                       | bar        | 16 <sup>1</sup> |
| Protection class         | IP 54                    |            |                 |
| Approval                 | MID (DE-15-MI004-PTB010) |            |                 |

<sup>1</sup>special version on request

### REACH

Information pursuant to Article 33 (1) of Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006:

This product series contains components with the following substances in a concentration of more than 0.1% weight by weight (w/w):  
- Lead (CAS no.: 7439-92-1)

### TECHNICAL DATA

| Nominal diameter                     | DN                              | mm                | 50       | 65       | 80       | 100      | 150      |
|--------------------------------------|---------------------------------|-------------------|----------|----------|----------|----------|----------|
| Nominal flow rate                    | q <sub>p</sub>                  | m <sup>3</sup> /h | 15       | 25       | 40       | 60       | 150      |
| Maximum flow rate (short-term)       | q <sub>s</sub>                  | m <sup>3</sup> /h | 30       | 30       | 50       | 75       | 187.5    |
| Minimum flow rate                    | q <sub>i</sub>                  | l/h               | 600      | 1000     | 1600     | 2400     | 6000     |
| Starting flow rate                   |                                 | l/h               | 60       | 60       | 90       | 90       | 1000     |
| Pressure loss at q <sub>p</sub>      | Δp                              | bar               | 0.06     | 0.14     | 0.09     | 0.07     | 0.09     |
| Pulse value reed switch <sup>1</sup> |                                 | l/pulse           | 10 / 100 | 10 / 100 | 10 / 100 | 10 / 100 | 10 / 100 |
| Metrological class <sup>2</sup>      | q <sub>p</sub> / q <sub>i</sub> |                   | 25:1     | 25:1     | 25:1     | 25:1     | 25:1     |
| Flow rate at 0.1 bar pressure loss   |                                 | m <sup>3</sup> /h | 19       | 21       | 42       | 70       | 160      |

<sup>1</sup>other pulse values on request

<sup>2</sup>other q<sub>p</sub> / q<sub>i</sub> on request

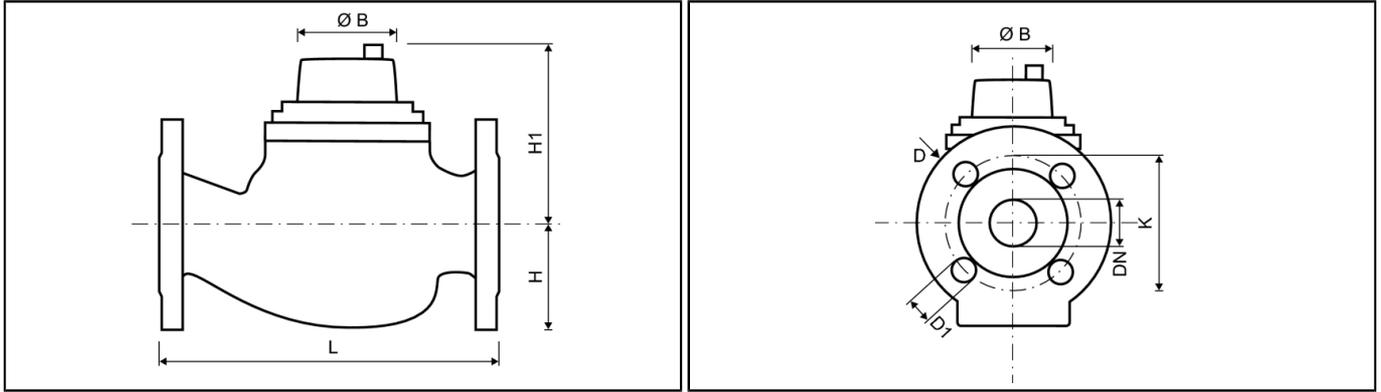
### DISPLAY RANGE

| Nominal diameter                   | DN | mm | 50 | 65 | 80 | 100 | 150 |
|------------------------------------|----|----|----|----|----|-----|-----|
| 0.5 l ... 999,999 m <sup>3</sup>   |    |    | •  | •  | •  | •   |     |
| 5.0 l ... 9,999,999 m <sup>3</sup> |    |    |    |    |    |     | •   |

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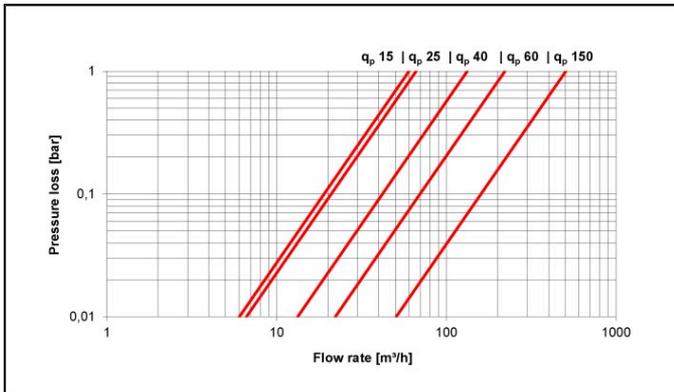
MECHANICAL FLOW SENSOR

## DIMENSIONS

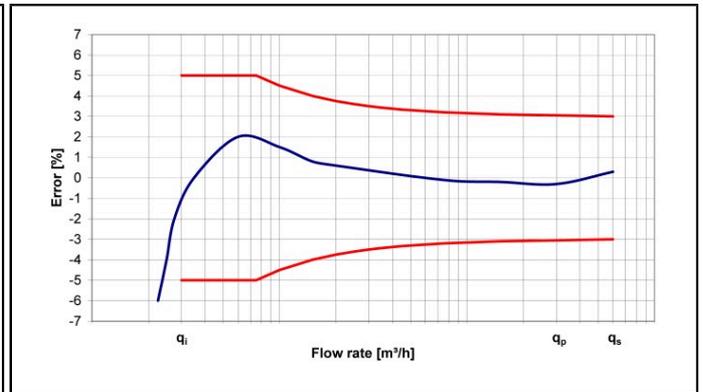


| Nominal diameter                   | DN  | mm  | 50   | 65  | 80    | 100 | 150  |
|------------------------------------|-----|-----|------|-----|-------|-----|------|
| Overall length (DIN 19625)         | L   | mm  | 270  | 300 | 300   | 360 | 500  |
| Overall length (DIN ISO 4064)      | L   | mm  | 300  | 300 | 350   | 350 | 500  |
| Flange diameter                    | D   | mm  | 165  | 185 | 200   | 220 | 285  |
| Hole circle diameter               | K   | mm  | 125  | 145 | 160   | 180 | 240  |
| Number of screwholes               |     | pcs | 4    | 4   | 8 / 4 | 8   | 8    |
| Screw hole diameter                | D1  | mm  | 18   | 18  | 18    | 18  | 23   |
| Height                             | H   | mm  | 84   | 97  | 102   | 113 | 155  |
| Height (without counter extension) | H1  | mm  | 155  | 155 | 190   | 200 | 400  |
| Height (with counter extension)    | H1  | mm  | 195  | 195 | 230   | 240 | 440  |
| Diameter                           | Ø B | mm  | 165  | 185 | 200   | 220 | 285  |
| Weight                             |     | kg  | 14.2 | 18  | 24    | 28  | 79.5 |

## PRESSURE LOSS GRAPH / TYPICAL ERROR GRAPH



Pressure loss graph



Typical error graph