



WIO 400

Water in oil sensor

Datasheet Rev. 1.08

111881-921 Rev. 1.08 WIO400 Datasheet

Date: 01-10-2015



Technical data, Sensors



WIO Standard 3/4" (ISO 228-1 G3/4"), Short



WIO Standard 1/2" (ISO 228-1 G1/2"), Short



WIO Ball Valve pipe, Long

| Output | |
|-------------------------------------|---|
| Analogue output (galvanic isolated) | 4 – 20 mA for a_w |
| Analogue output (galvanic isolated) | 4 – 20 mA for temperature (0°C – 100°C) |
| Max. Load (analogue output) | < 500Ω |
| Measurement Range (4 – 20 mA) | 0,01 – 1,00 a_w |
| Accuracy (0,05-0,95 a_w) | ± 0,03 a_w |
| Accuracy (outside 0,05-0,95 a_w) | ± 0,05 a_w |
| Resolution | < 0,004 a_w |
| Digital output | Communication RS485 |
| Communication Protocol | Modbus RTU |
| Input | |
| Supply nominal voltage | 24V DC ± 10% |
| Max. residual voltage ripple | 10% |
| Maximum Load current | 200 mA |
| Max. Power input | < 4,8 VA |



| Relays | |
|--------------------------------|--------------------------|
| Contact arrangement | 2 x Normally Closed (NC) |
| Rated voltage | 60V |
| Rated current (40°C) | 1A |
| Max. DC Load breaking capacity | |
| Relay 1 | „High Alarm“ |
| Relay 2 | „High High Alarm“ |
| Default High Alarm | 0,50 a _w |
| Default High High Alarm | 0,90 a _w |

| Socket specification | |
|------------------------------|--|
| Connector design | 1x male socket, 1x female socket |
| Connector locking system | Screw-locking, M12x1 |
| Wire gauge | 0,25 mm ² |
| Contacts | 8 Pol |
| Rated voltage | 60V |
| Rated current (40°C) | 1A |
| Cable specification | |
| Cable design | Multipair overall screened cable |
| Outlet diameter | 9,9 mm |
| Voltage class | 0,6/1kV |
| Wires | 4x2 twisted pair |
| Wire gauge | 0,75 mm ² |
| Media for measurement | |
| Lubrication oil | Grade SAE 30/TBN 5-10 |
| Max. Oil temperature | 90°C |
| Max. Oil pressure | Sensor mounting method in application: Ball valve mounted: Max. 10 Bar Thread mounted: Max. 20 Bar |



| Response times | |
|---|--|
| Delay before valid data from start-up | < 30 s |
| Delay before valid data from installation (first use) | 10 minutes |
| Device Failure Indication | |
| Analogue output | < 2 mA |
| Manual test | |
| Press sensor test button for 5 seconds | High Alarm turns on for 5 seconds |
| Press sensor test button for 10 seconds | High Alarm turns off High High Alarm turns on for 5 seconds |
| Press sensor test button for 15 seconds | Normal operating and test button ignored |
| Miscellaneous | |
| Ambient Temperature, running / storage | 0 - 90°C / -30 - +95°C |
| Relative humidity for running and storage | 10% up to 95%, no condensation |
| Re calibration | Recommended with max 3 years interval |
| Warranty | 2 years |
| Approvals | |
| Germanischer Loyd | WIO products are EU approval under 75 965 - 09 HH date 2009-11-30 |
| Enclosure | |
| Weight for WIO standard | 650 grams |
| Weight for WIO Ball valve pipe | 790 grams |
| Connection (mechanical) | ISO 228-1 G 1/2" or 3/4" thread 2 x 8-pole connectors, male and female, M12x1 thread |
| Enclosure material | Stainless Steel/Aluminum EN44100 (Former 4261) |
| Protective type | IP66 |



Technical Data, Terminal Boxes



| Output | |
|-----------------------------------|--|
| Analogue output | See the specifications for sensor's analogue output |
| Digital output | See the specifications for sensor's digital output |
| Input | |
| Supply nominal voltage | 24V DC \pm 10% |
| Max. residual voltage ripple | 10% |
| Maximum Load current | 200 mA |
| Max. Power input | < 4,8 VA |
| Relays | |
| Contact arrangement | 2 x Normally Open (NO) |
| Rated voltage | 250 VAC |
| Max. switching voltage | 400VAC |
| Rated current | 2A |
| Breaking capacity max. | 1250VA |
| Enclosure | |
| Weight | 650 grams |
| Connection to sensor (mechanical) | 2 x 8-pole connectors, male and female, M12x1 thread |
| Connection (mechanical) | 2 x M20 gland, cable diameter 6 to 12 mm 1 x D-sub9, male |
| Enclosure material | Aluminum |
| Protective type | IP66 |
| Warranty | 2 years |



Technical Data Terminal Display Box



| Output | |
|--|--|
| Analogue output | See the specifications for sensor's analogue output |
| Digital output | See the specifications for sensor's digital output |
| Input | |
| Supply nominal voltage | 24V DC \pm 10% |
| Max. residual voltage ripple | 10% |
| Maximum Load current | 200 mA |
| Max. Power input | < 4,8 VA |
| Relays | |
| Contact arrangement | 2 x Normally Open (NO) |
| Rated voltage | 250 VAC |
| Max. switching voltage | 400VAC |
| Rated current | 2A |
| Breaking capacity max. | 1250VA |
| Display version - a_w (water activity from 0,01 to 1,00) | |
| Accuracy (0,05-0,95 a_w) | \pm 0,03 a_w |
| Resolution | <0,004 a_w |
| Display version - PPM (H₂O) | |
| Accuracy (0,05-0,95 a_w) | \pm 30% |
| Resolution | 1 PPM |
| Enclosure | |
| Weight | 650 grams |
| Connection to sensor (mechanical) | 2 x 8-pole connectors, male and female, M12x1 thread |
| Connection (mechanical) | 2 x M20 gland, cable diameter 6 to 12 mm 1 x D-sub9, male |
| Enclosure material | Aluminum |
| Protective type | IP66 |
| Warranty | 2 years |

PAJ Group A/S • Grundtvigs Allé 163 • DK-6400 Sønderborg

Tel: +45 74 43 71 81 • Fax: +45 74 43 71 91 • CVR: 3459-1229 • www.paj.dk • e-mail: paj@paj.dk

APPROVALS: ISO 9001, ISO 14001, ISO 13485, IEC 61340-51 & IPC-A-610 CLASS 3

03-01-0501-CRJ-04 Side 6 af 20



Technical Data Terminal Box Alarm



| Output | |
|-----------------------------------|--|
| Analogue output | See the specifications for sensor's analogue output |
| Digital output | See the specifications for sensor's digital output |
| Input | |
| Supply nominal voltage | 24V DC \pm 10% |
| Max. residual voltage ripple | 10% |
| Maximum Load current | 200 mA |
| Max. Power input | < 4,8 VA |
| Relays | |
| Contact arrangement | 2 x Normally Open (NO) |
| Rated voltage | 250 VAC |
| Max. switching voltage | 400VAC |
| Rated current | 2A |
| Breaking capacity max. | 1250VA |
| Buzzer | |
| Oscillation frequency | 3000 \pm 500 Hz |
| Sound pressure level | 85db by open housing |
| Tone | pulsed |
| Button with LED | |
| Blink frequency | 2 Hz |
| Color | RED |
| Enclosure | |
| Weight | 530 grams |
| Connection to sensor (mechanical) | 2 x 8-pole connectors, male and female, M12x1 thread |
| Connection (mechanical) | 2 x M20 gland, cable diameter 6 to 12 mm 1 x D-sub9, male |
| Enclosure material | Aluminum |
| Protective type | IP66 |
| Warranty | 2 years |



Technical Data Terminal Box Alarm Buzzer



| Output | |
|--|---|
| Analogue output | See the specifications for sensor's analogue output |
| Digital output | See the specifications for sensor's digital output |
| Input | |
| Supply nominal voltage | 24V DC \pm 10% |
| Max. residual voltage ripple | 10% |
| Maximum Load current | 200 mA |
| Max. Power input | < 4,8 VA |
| Relays | |
| Contact arrangement | 2 x Normally Open (NO) |
| Rated voltage | 250 VAC |
| Max. switching voltage | 400VAC |
| Rated current | 2A |
| Breaking capacity max. | 1250VA |
| Display version - a_w (water activity from 0,01 to 1,00) | |
| Accuracy (0,05-0,95 a_w) | \pm 0,03 a_w |
| Resolution | <0,004 a_w |
| Display version - PPM (H₂O) | |
| Accuracy (0,05-0,95 a_w) | \pm 30% |
| Resolution | 1 PPM |
| Buzzer | |
| Oscillation frequency | 3000 \pm 500 Hz |
| Sound pressure level | 85db by open housing |
| Tone | pulsed |



| Button with LED | |
|-----------------------------------|--|
| Blink frequency | 2 Hz |
| Color | RED |
| Enclosure | |
| Weight | 650 grams |
| Connection to sensor (mechanical) | 2 x 8-pole connectors, male and female, M12x1 thread |
| Connection (mechanical) | 2 x M20 gland, cable diameter 6 to 12 mm 1 x D-sub9, male |
| Enclosure material | Aluminum |
| Protective type | IP66 |
| Warranty | 2 years |



Technical Data Terminal Box Alarm Buzzer



| Output | |
|--|---|
| Analogue output | See the specifications for sensor's analogue output |
| Digital output | See the specifications for sensor's digital output |
| Input | |
| Supply nominal voltage | 24V DC \pm 10% |
| Max. residual voltage ripple | 10% |
| Maximum Load current | 200 mA |
| Max. Power input | < 4,8 VA |
| Relays | |
| Contact arrangement | 2 x Normally Open (NO) |
| Rated voltage | 250 VAC |
| Max. switching voltage | 400VAC |
| Rated current | 2A |
| Breaking capacity max. | 1250VA |
| Display version - a_w (water activity from 0,01 to 1,00) | |
| Accuracy (0,05-0,95 a_w) | \pm 0,03 a_w |
| Resolution | <0,004 a_w |
| Display version - PPM (H₂O) | |
| Accuracy (0,05-0,95 a_w) | \pm 30% |
| Resolution | 1 PPM |
| Display version - °C | |
| Accuracy | \pm 2°C |
| Resolution | 0,01 °C |



| Buzzer | |
|-----------------------------------|--|
| Oscillation frequency | 3000±500 Hz |
| Sound pressure level | 85db by open housing |
| Tone | pulsed |
| Button with LED | |
| Blink frequency | 2 Hz |
| Color | RED |
| Enclosure | |
| Weight | 750 grams |
| Connection to sensor (mechanical) | 2 x 8-pole connectors, male and female, M12x1 thread |
| Connection (mechanical) | 2 x M20 gland, cable diameter 6 to 12 mm 1 x D-sub9, male |
| Enclosure material | Aluminum |
| Protective type | IP66 |
| Warranty | 2 years |



Technical data, WIOI (WIO Integrated)



| Output | |
|-------------------------------------|---------------------|
| Analogue output (galvanic isolated) | 4 – 20 mA for a_w |
| Max. Load (analogue output) | < 500 Ω |
| Measurement Range (4 – 20 mA) | 0,01 – 1,00 a_w |
| Accuracy (0,05-0,95 a_w) | $\pm 0,03 a_w$ |
| Accuracy (outside 0,05-0,95 a_w) | $\pm 0,05 a_w$ |
| Resolution | < 0,004 a_w |
| Digital output | Communication RS485 |
| Communication Protocol | Modbus RTU |
| Input | |
| Supply nominal voltage | 24V DC $\pm 10\%$ |
| Max. residual voltage ripple | 10% |
| Maximum Load current | 200 mA |
| Max. Power input | < 4,8VA |



| Relays | |
|--------------------------------|--|
| Contact arrangement | 2 x Normally Open (NO) |
| Rated voltage | 250VAC |
| Max. switching voltage | 400VAC |
| Rated current | 2A |
| Breaking capacity max. | 1250VA |
| Max. DC Load breaking capacity | <p>The graph plots DC voltage [Vdc] on the y-axis (ranging from 10 to 300) against DC current [A] on the x-axis (ranging from 0.1 to 20). A curve labeled 'resistive load' shows a constant voltage of 300V up to approximately 0.2A, followed by a non-linear decrease to 30V at 5A. The x-axis has major ticks at 0.1, 0.2, 0.5, 1, 2, 5, 10, and 20. The y-axis has major ticks at 10, 20, 30, 40, 50, 100, 200, and 300.</p> |
| Relay 1 | „High Alarm“ |
| Relay 2 | „High High Alarm“ |
| Default High Alarm | 0,50 a _w |
| Default High High Alarm | 0,90 a _w |

| Cable specification | |
|----------------------------|----------------------------------|
| Cable design | Multipair overall screened cable |
| Outlet diameter | 9,9 mm |
| Voltage class | 0,6/1kV |
| Wires | 4x2 twisted pair |
| Wire gauge | 0,75 mm ² |

| Media for measurement | |
|------------------------------|--|
| Lubrication oil | Grade SAE 30/TBN 5-10 |
| Max. Oil temperature | 90°C |
| Max. Oil pressure | Sensor mounting method in application: Ball valve mounted: Max. 10 Bar Thread mounted: Max. 20 Bar |

| Response times | |
|---|------------|
| Delay before valid data from start-up | < 30 s |
| Delay before valid data from installation (first use) | 10 minutes |



| Device Failure Indication | |
|---|---|
| Analogue output | < 2 mA |
| Manual test | |
| Press sensor test-button for 5 seconds | High Alarm turns on for 5 seconds |
| Press sensor test-button for 10 seconds | High Alarm turns off High High Alarm turns on for 5 seconds |
| Press sensor test-button for 15 seconds | Normal operating and test button ignored |
| Display version - a_w (water activity from 0,01 to 1,00) | |
| Accuracy (0,05-0,95 a _w) | ± 0,03 a _w |
| Resolution | <0,004 a _w |
| Display version - PPM (H₂O) | |
| Accuracy (0,05-0,95 a _w) | ±30% |
| Resolution | 1 PPM |
| Buzzer | |
| Oscillation frequency | 3000±500 Hz |
| Sound pressure level | 85db by open housing |
| Tone | pulsed |
| Button with LED | |
| Blink frequency | 2 Hz |
| Color | RED |
| Enclosure | |
| Weight | 4000 grams |
| Connection (mechanical) | ISO 228-1 G ½" or ¾" thread 2 x gland M20, cable diameter 6 to 12 mm 1 x D-sub9, male |
| Enclosure material | Stainless Steel/Aluminum EN44100 (Former 4261) |
| Protective type | IP66 |

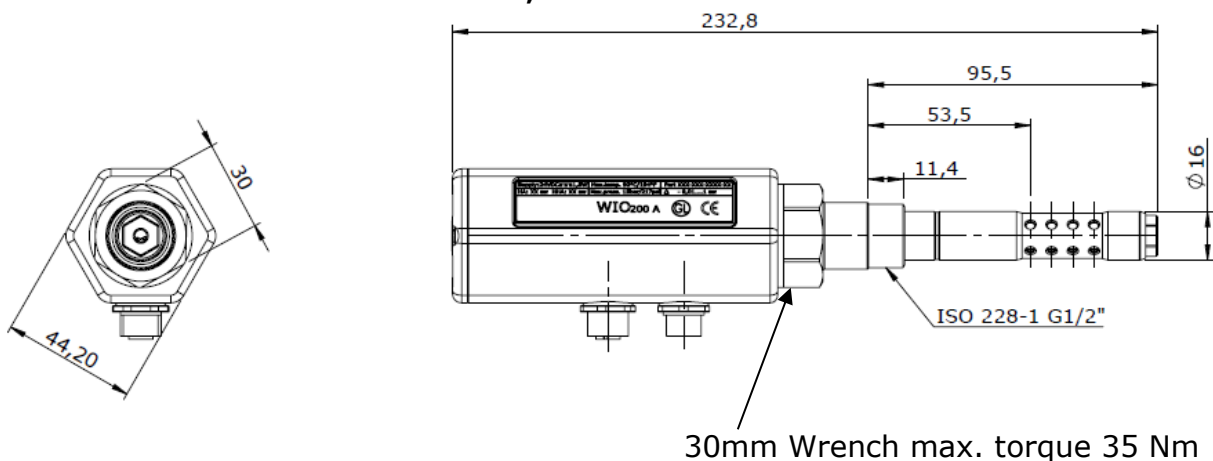


| Miscellaneous | |
|---|---|
| Ambient Temperature, running / storage | 0 - 90°C / -30 - +95°C |
| Relative humidity for running and storage | 10% up to 95%, no condensation |
| Re calibration | Recommended with max 3 years interval |
| Warranty | 2 years |
| Approvals | |
| Germanischer Lloyd | WIO products are EU approval under 75 965 - 09 HH date 2009-11-30 |

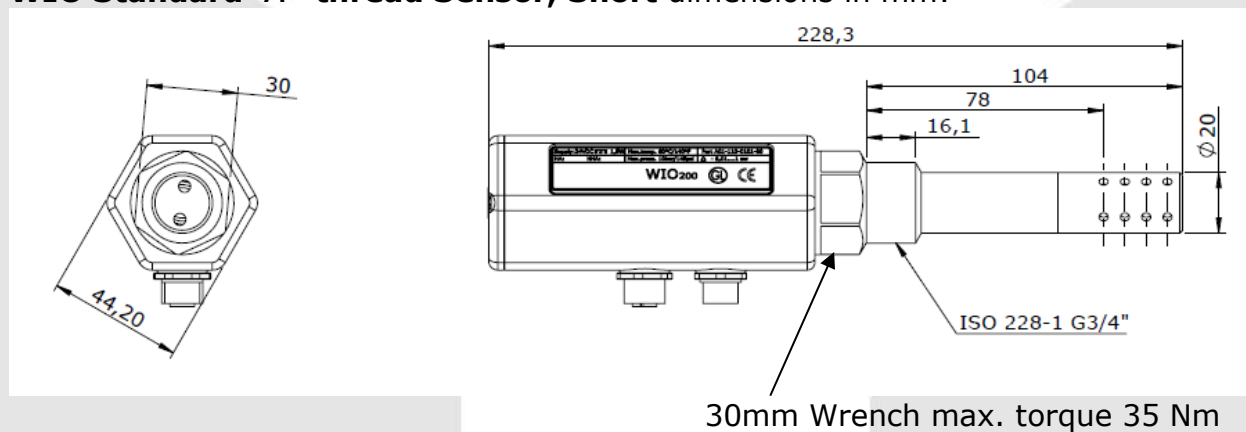


WIO Sensors, dimensions in mm

WIO Standard 1/2" thread Sensor, Short dimensions in mm:

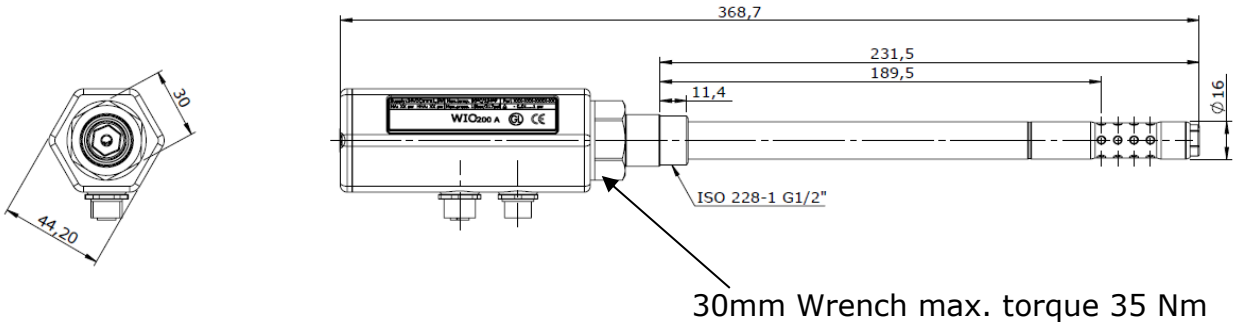


WIO Standard 3/4" thread Sensor, Short dimensions in mm:

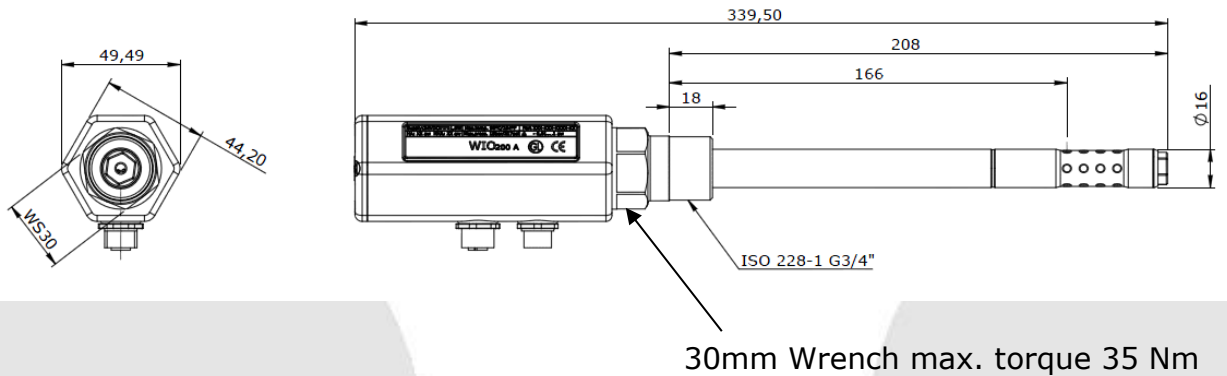




WIO Ball Valve pipe 1/2" thread Sensor, Long dimensions in mm:

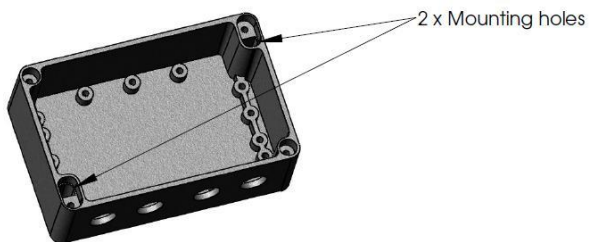
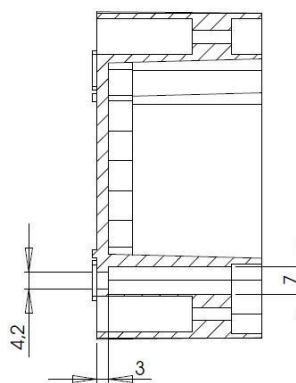
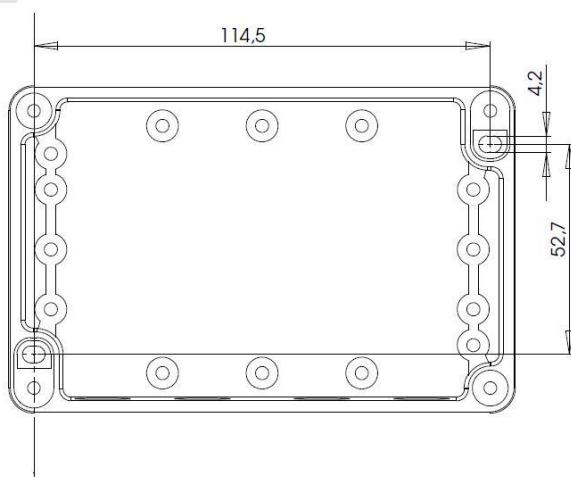
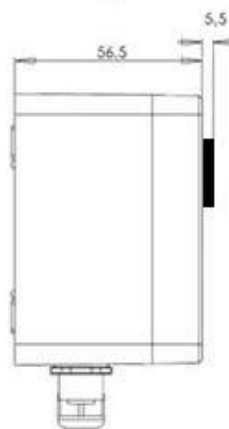
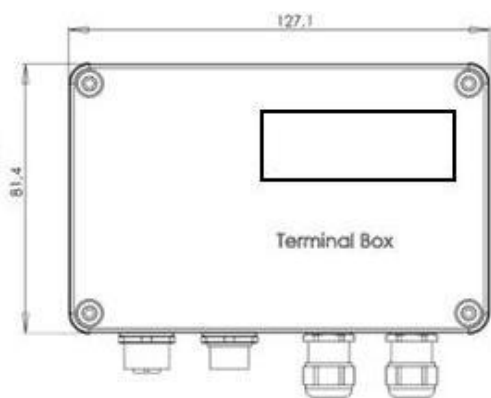
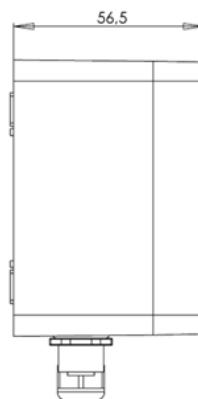
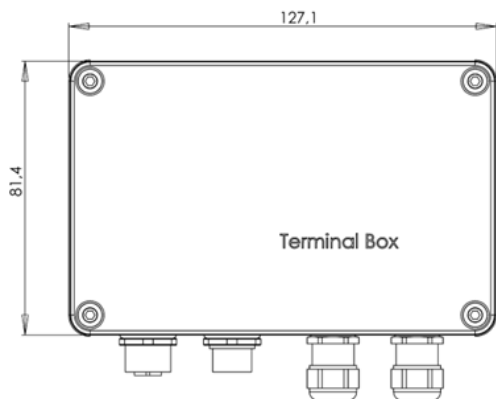


WIO Ball Valve pipe 3/4" thread Sensor, Long dimensions in mm:



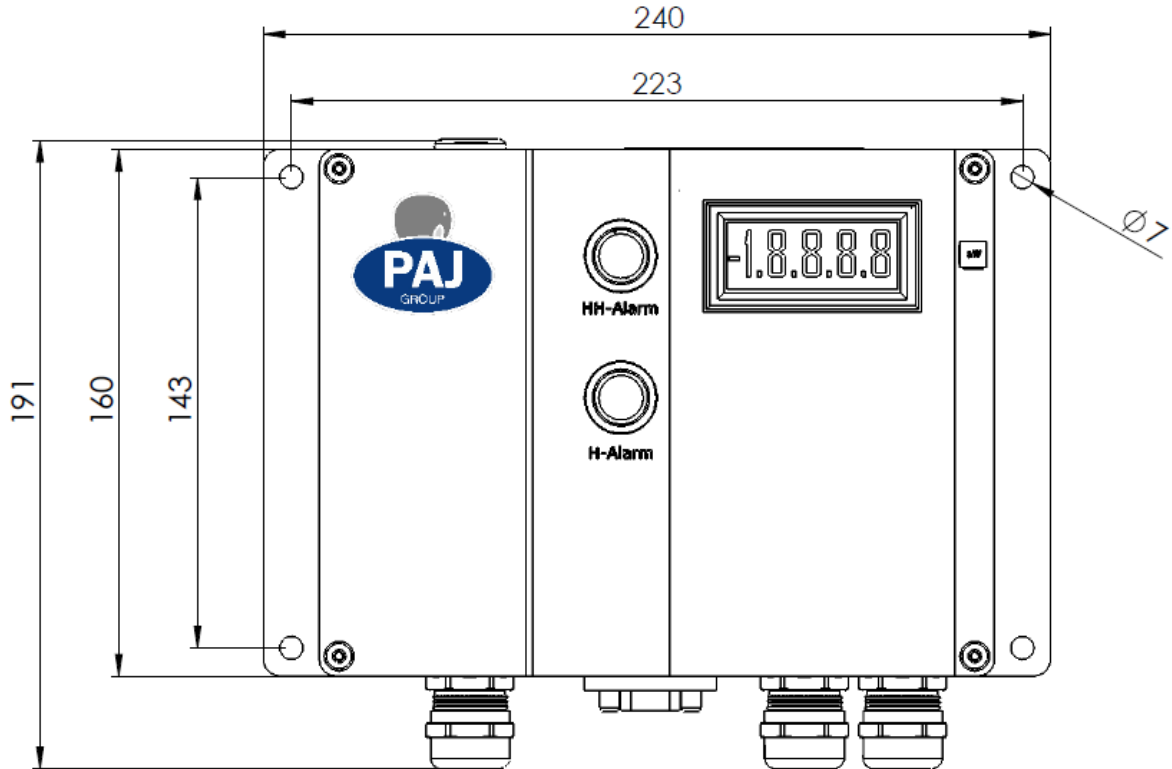


Terminal box, dimensions in mm

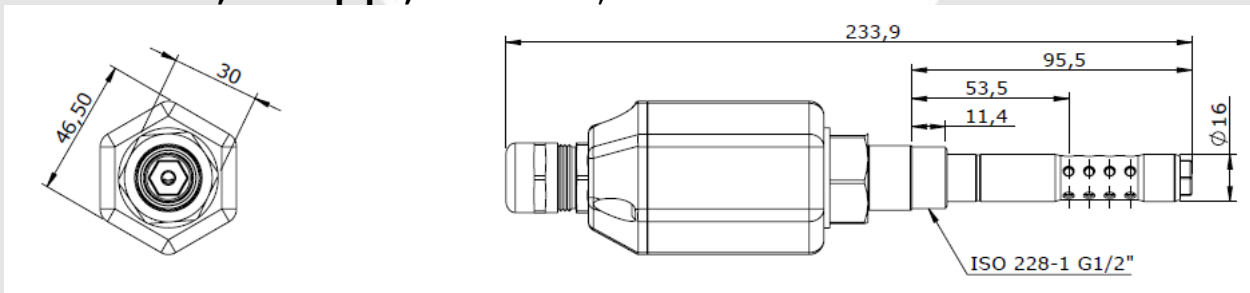




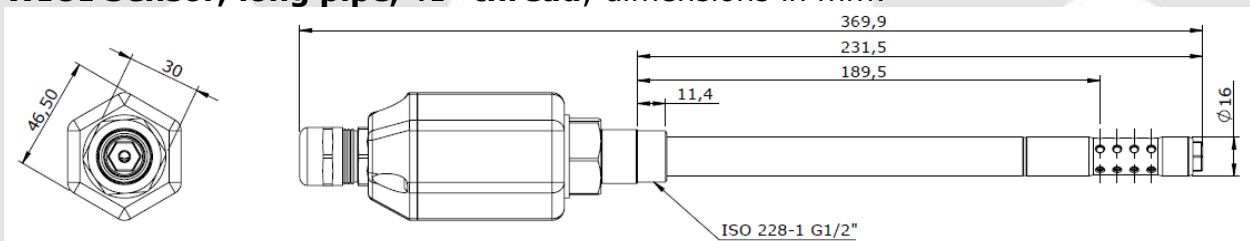
WIO Integrated (WIOI), dimensions in mm



WIOI Sensor, short pipe, 1/2" thread, dimensions in mm:



WIOI Sensor, long pipe, 1/2" thread, dimensions in mm:





WIOI Sensor, long pipe, 3/4" thread, dimensions in mm:

