

The **INVALCO Model 4728 S&W Monitor**, in conjunction with a **Model 4528EZ Detector** and a **Model CX-645 Capacitance Probe** is a continuous on-line monitor of percent water in a flowing crude oil emulsion stream. This unit displays percent of water in various ranges from 0-5% up to and including 0-20% on a digital LCD indicator. In addition, the Model 4728 provides a 4-20 mA analog output proportional to input range, and a field-adjusted, time-delayed, limit relay for valve control or alarming.

The Model 4728 utilizes CMOS circuitry for low power consumption, high reliability, and wide temperature stability.

Features

- **Real-Time Display and Retransmission of S&W** - Allows quick response to upset conditions for downstream controls.
- **Adjustable Delay of Relay Closure** - Prevents nuisance alarms and "actuator overload".
- **Direct Analog Output from Model 4528EZ Detector** - A 4-20 mA signal is standard from the probe without the need to include the Model 4728 monitor.
- **NACE Adaptable** - Can be modified for use in sour service.

Applications

LACT (Lease Automatic Custody Transfer) Units

Detect and reroute oil that has been contaminated by excess S&W.

Pipeline Loading

Monitor transfer of petroleum/condensate products from offshore loading facilities.

Dehydration Equipment

Determine and enhance equipment efficiencies.

Fuel Oil Monitoring

Determine contamination of fuel oil by condensation or other external factors before entry to engine.

Storage and Treating Facilities

Monitoring and early detection of undesirable conditions as well as interface detection during de-watering of storage tanks.

Model 4728 Specifications

Power Supply

18-28 Vdc @ 130 mA

115/220 Vac

S&W Range

0-5%, 0-10%, and 0-20% range options.



Model 4728 Monitor and Model CX-645 Probe

Display

Four digit LCD with decimal point.

Analog Outputs

4-20 mA, 2-wire internally powered or 4-20 mA, 3-wire externally powered.

Relay Output

SPDT Relay, 10A, 250 Vac.

1/2 Hp 250 Vac, 10A - 120 Vac resistive.

1/3 Hp 120 Vac, 10A - 30 Vdc resistive.

Time Delay

0 to 90 seconds adjustable in 10 second increments.

Off-delay approximately 10% of on-delay time.

Temperature Range

-20°F to 160°F (-20°C to 70°C).

Enclosures

NEMA 4X, weatherproof.

NEMA 7, explosion-proof, Class I, Division 1, Groups C and D.

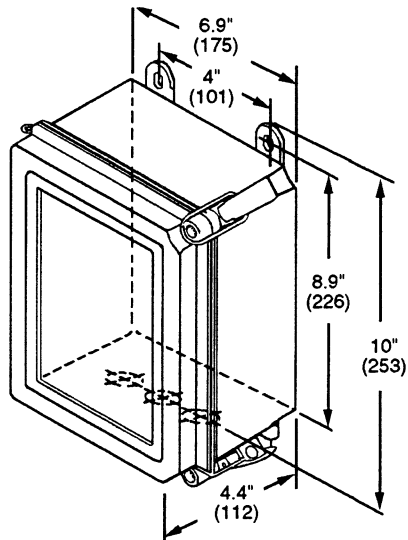
Model 4728 Ordering Information



Model No.	Description	Part number
Model 4728-PM	4728 Oil/Water Monitor, All Ranges, Panel Mount	81001148
Model 4728-3WP	4728 Oil/Water Monitor, 0-3% range, Nema 4X - WP	81001103
Model 4728-3XP	4728 Oil/Water Monitor, 0-3% range, Nema 7 - XP	81001113
Model 4728-5WP	4728 Oil/Water Monitor, 0-5% range, Nema 4X - WP	81001114
Model 4728-5XP	4728 Oil/Water Monitor, 0-5% range, Nema 7 - XP	81001115
Model 4728-10WP	4728 Oil/Water Monitor, 0-10% range, Nema 4X - WP	81001126
Model 4728-10XP	4728 Oil/Water Monitor, 0-10% range, Nema 7 - XP	81001116
Model 4728-20WP	4728 Oil/Water Monitor, 0-20% range, Nema 4X - WP	81001128
Model 4728-20XP	4728 Oil/Water Monitor, 0-20% range, Nema 7 - XP	81001117

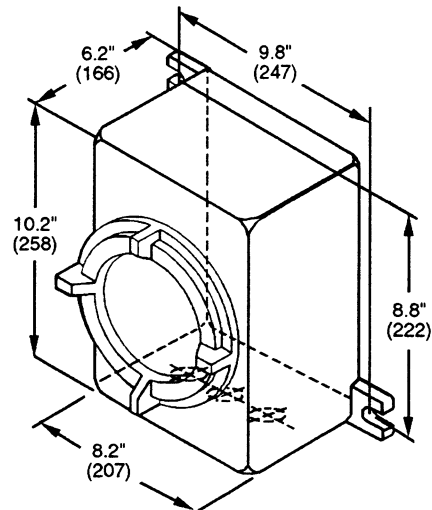
Model 4728 Dimensional Specifications

Inches (mm)



NEMA 4X Weatherproof Housing

Note: Dimensions - Inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.



NEMA 7 Explosion-Proof Housing

Model 4528EZ Detector and Model CX-645 Probe

The Model 4528EZ Detector and Model CX-645 Probe provide a direct analog (0-5 Vdc and 4-20 mA) output of percent emulsified water (as S&W) in the process stream. This signal is designed to be used externally by the Model 4728 monitor or other control devices such as PLC's or Remote Terminal Systems.

The probe is constructed of two concentric tubes. Wetted surfaces are coated with a baked-on phenolic two-part epoxy. The inner tube is insulated from the outer tube by Teflon spacers and is electrically connected to a terminal

within the sensor housing. The internal element spacers can be fitted with trimmer rods should it be necessary to adjust the base capacitance.

The detector operates from a 8-28 Vdc regulated power supply from within the associated monitor or customer-supplied source. All calibration and adjustments can be accessed through the front panel for ease of use. The Model 4528EZ detector offers the flexibility of a high or low fail-safe. This fail-safe feature guarantees the quality of the output signal from the detector chassis and will sense over- and under-range conditions as well as an open or shorted probe.

Model CX-645 Capacitance Probe & Model 4528EZ Detector



Model CX-645 Capacitance Probe & Model 4528EZ Detector

Model No.	Description	Part number
Model 4528EZ	S&W Detector for CX-645 probe, Field Selectable Range 0-5%, 0-10%, 0-20%	P518796

Detector/Probe Specifications

Power Supply

8-28 Vdc @ 130 mA

S&W Range Field Selectable

0-5%, 0-10%, and 0-20%.

Measurement Accuracy

±1.0% of full scale.

Resolution/Sensitivity

±0.5% of full scale.

Probe Material

A53 GrB Carbon Steel is standard.

Stainless Steel available.

Probe Finish

Baked-on phenolic two-part epoxy.

Probe Sizes/Length

2" I.D. is 17" face-to-face.

3" to 12" I.D. sizes are 32" face-to-face.

Process Connections

ANSI RF or RTJ Flanges to 600# (all sizes) (others by special order).

Threaded MNPT or Grooved (2" and 3").

Pressure Ratings

As per Flange selection, 1440 psig max. (Others by special order)

NPT - 1440 psig max.

Victualic grooved - 350 psig

Temperature Range

-20°F to 180°F standard.

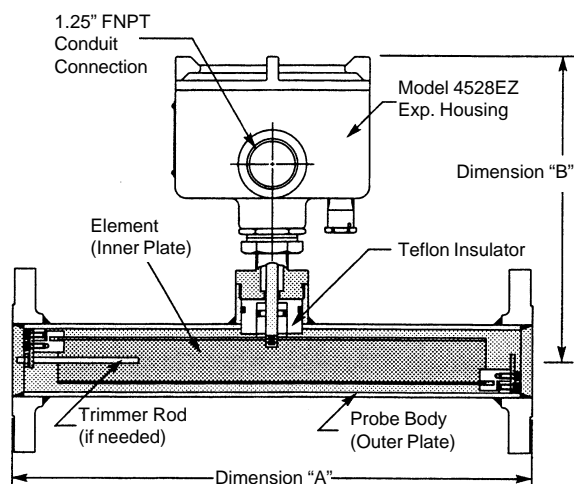
-20°F to 375°F optional.

Approvals

UL/C-UL Explosion-proof certificate for Class I, Div. 1, Groups C and D or Class II, Groups E, F, and G hazardous locations.

Dimensions - CX-645 Specifications

Inches (mm)

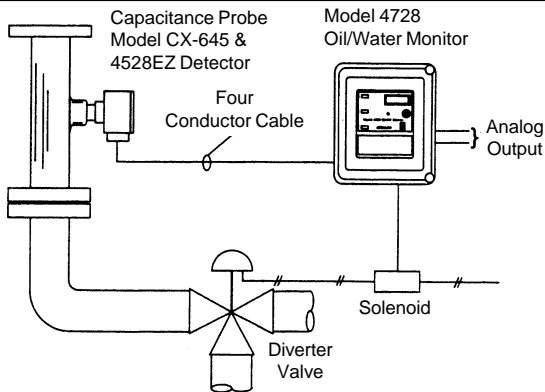


Size	Dim. A	Dim. B	Weight (lb)
2 Inch	17.0" (431)	9.8" (247)	20
3 Inch	32.0 (811)	10.9" (275)	45
4 Inch	32.0 (811)	11.9" (301)	72
6 Inch	32.0 (811)	14.0" (355)	127
8 Inch	32.0 (811)	16.0" (405)	190
10 Inch	32.0 (811)	18.1" (459)	268
12 Inch +	Consult Factory		

*-20°F to 180°F dimension given. For -20°F to 375°F dimension add 6.4".

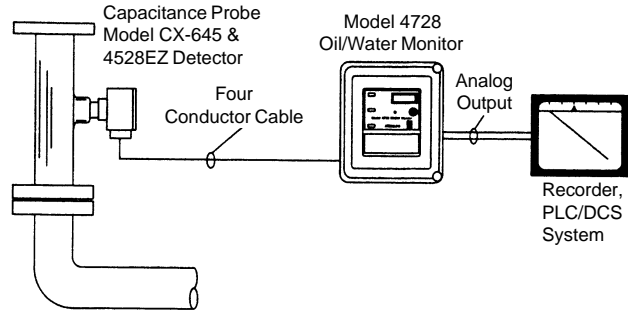
Note: Dimensions - Inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.

Typical Applications



Percent Water Indication and Set-Point Control

In this application the adjustable alarm may be used to operate a diverter valve should the water content exceed a preset percentage. Local indication is provided and an analog output for other indication or control functions is available.



Percent Water Recording

In this application the Model 4728 provides local reading on an LCD display and provides an analog output (4-20 mA) to a standard recorder, PLC, or DCS System. This configuration is used to monitor and control Separator and Heater-Treater efficiencies as well as other oil field and industrial applications.

CX-645 Capacitance Probe Ordering Information

CX-645	BS&W Probe, Ranges from 0-20% water - to be used with Model 4528EZ Detector	
	PROBE MATERIAL: Carbon Steel	
	CODE	PROBE BODY SIZE
	2	2 INCH I.D. x 17" FACE TO FACE
	3	3 INCH I.D. x 32" FACE TO FACE
	4	4 INCH I.D. x 32" FACE TO FACE
	6	6 INCH I.D. x 32" FACE TO FACE
	8	8 INCH I.D. x 32" FACE TO FACE
	10	10 INCH I.D. x 32" FACE TO FACE
	CODE	END CONNECTIONS
	00	SCREWED ENDS (to 3" only)
	00	GROOVED ENDS/Victaulic (to 4" only)
	00	150 LB ANSI RAISED FACE
	30	300 LB ANSI RAISED FACE
	60	600 LB ANSI RAISED FACE (SCH 80) (FOR 8" AND 10")
	90	900 LB ANSI RAISED FACE and RING JOINT (SCH 160) (10")
	05	150 LB ANSI RTJ
	35	300 LB ANSI RTJ
	65	600 LB ANSI RTJ (SCH 80) (FOR 8" AND 10")
	95	900 LB ANSI RTJ (SCH 80)
	115	1500 LB ANSI RTJ (SCH 160)
	CODE	MATERIAL AND TEMPERATURE OPTIONS
	B	STANDARD MATERIALS, A53B CARBON STEEL, -20-180° F
	H	STANDARD MATERIALS/HIGH TEMP, -20 - 375° F
	S	316 STAINLESS STEEL MATERIALS, -20-180F
	T	316 STAINLESS STEEL/HIGH TEMP, -20 -375°F
	CODE	CONNECTION STYLE
	S	SCREWED CONNECTIONS, MNPT
	G	VICTAULIC CONNECTIONS (GROOVED)
	F	FLANGED CONNECTIONS
	CODE	OPEN
	P	PHENOLIC COATING (Interior)
Example:		
CX - 645 -	3	60 - B F P = CX-645-360-BFP
Choose one code selection from each option group to build model number.		



www.fmcinvalco.com

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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