T7413A / VF20 / WPF20
IMMERSION TEMPERATURE SENSOR

FEATURES

- **PT1000 or NTC20kΩ temperature sensing element**
- **Wide sensing range**
- **High accuracy**
- **Choice of two different immersion well lengths**

SPECIFICATION

Nominal value

PT1000	1000 Ω at 0 °C
NTC20kΩ	20 kΩ at 25 °C

Accuracy

PT1000	IEC751 Class B
	0.3 K +0.5% • |t| (t in °C)
NTC20kΩ	0.3 K at 25 °C

Sensitivity

PT1000	≈ 3.85 Ω / K
NTC20kΩ	≈ -934.5 Ω / K at 25 °C (non-linear)

Response time

with brass well	$\tau_{0.5} \approx 18$ s (with immersion well)
with stainless steel well	$\tau_{0.5} \approx 30$ s (with immersion well)

Electrical connection

T7413A/VF20	terminals for 2 x 1.5 mm² cable
WPF20	terminals for 3 x 1.5 mm² cable

Ambient limits (housing)

storage temperature	-35...+70 °C (-31...+158 °F)

Safety (terminal box)

Protection standard	IP54 (T7413A)
	IP52 (VF20/WPF20)
Flame retardant	V1 as per UL94, Plastic (PC)
Dimensions	See page 3

GENERAL

These Immersion temperature sensors are used in the following hot or cold water control systems

- Excel 5000
- MicroniK 200
- MicroniK 100
- Excel Classic
- Excel Plus
- High Performance Excel Plus
- Excel EMC

or other systems using PT1000 or NTC20kΩ temperature sensing elements.

The sensors with a stainless steel immersion well are also suitable for registering domestic water temperature.

The WPF20 are mean value sensors, for establishing the mean value using two sensors.

CE

Models

OS-no.	sensor type	sensing range	length in mm (inches)		immersion well
			L1	T1	
VF20T	NTC 20 kΩ	-25...+130 °C	185 (7.28)	152 (5.98)	VFHT
VF20L			338 (13.30)	305 (12.00)	VFL
VF20NT		-25...+130 °C*	185 (7.28)	152 (5.98)	VFNT
VF20LN			338 (13.30)	305 (12.00)	VFLN
T7413A1009	PT1000	-25...+130 °C	193 (7.59)	160 (6.29)	VFHT
T7413A1041		-25...+130 °C*	185 (7.28)	152 (5.98)	not included
T7413A1058			338 (13.30)	305 (12.00)	
WPF20T	NTC 20 kΩ (two sensors)	-25...+130 °C	185 (7.28)	152 (5.98)	VFHT
WPF20L			338 (13.30)	305 (12.00)	VFL
*When a stainless steel immersion well is used. Maximum permitted temperature: 150 °C.					

Immersion Well

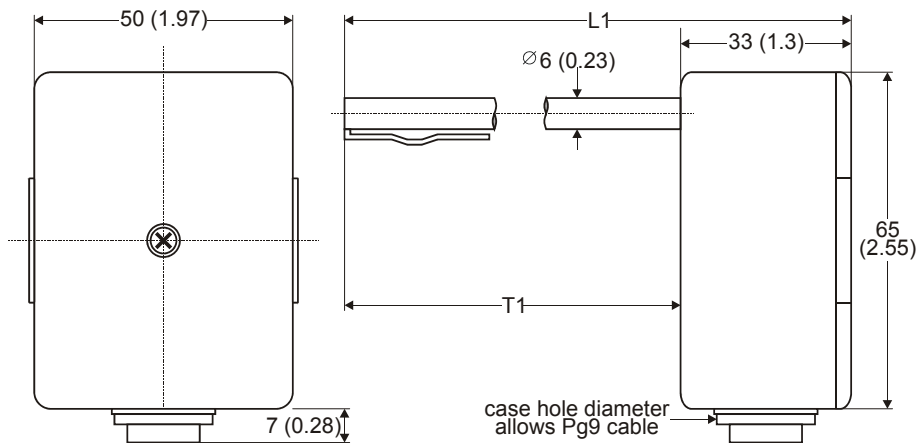| OS-no.	length mm (inch) T2	immersion well	P$_{max}$	max. flow rate
VFHT	135 (5.31)	brass, R1/2" / BSP1/2", PN16	15 bar	8 m/s
VFL	300 (11.81)			3 m/s
VFNT	135 (5.31)	stainless steel, R1/2" / BSP1/2" PN25	25 bar	15 m/s
VFLN	300 (11.81)			6 m/s

DIMENSIONS

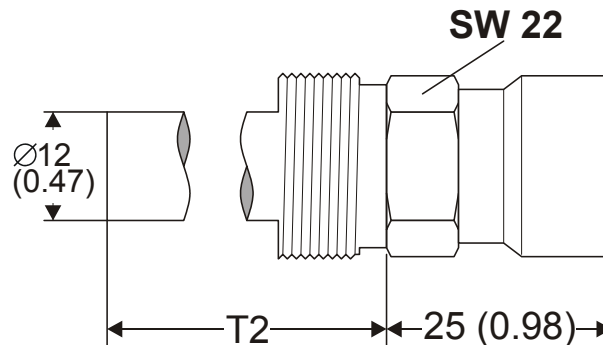

Fig. 1. Immersion temperature sensor, dimensions in mm (inches)

Fig. 2. Immersion wells, dimensions in mm (inches)

INSTALLATION

wiring run	max. length
Sensor to controller	200 m (660 ft)

Offset due to wire resistance per 10 m of distance from sensor to controller, when using the T7413A (PT1000):

type of wire	temperature offset PT1000
0.5 mm^2 (AWG20)	0.18 °C (0.324 °F)
1.0 mm^2 (AWG17)	0.09 °C (0.162 °F)
1.5 mm^2 (AWG15)	0.06 °C (0.108 °F)

NOTE: Use shielded wiring in areas with high EMI. Keep 15 cm (5.9'') minimum distance between sensor lines and 230 Vac power lines.

ELECTRICAL CONNECTION

The wiring of the temperature sensor must be in accordance with the overall wiring circuit diagram.

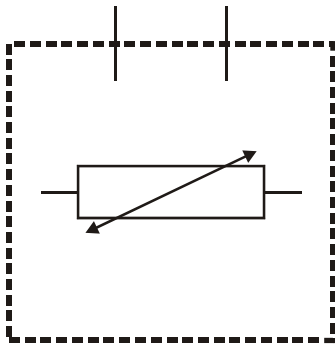The terminals are not polarized. Thus, connecting the wires in reverse will not result in any malfunction.
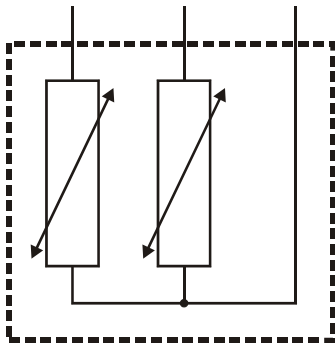
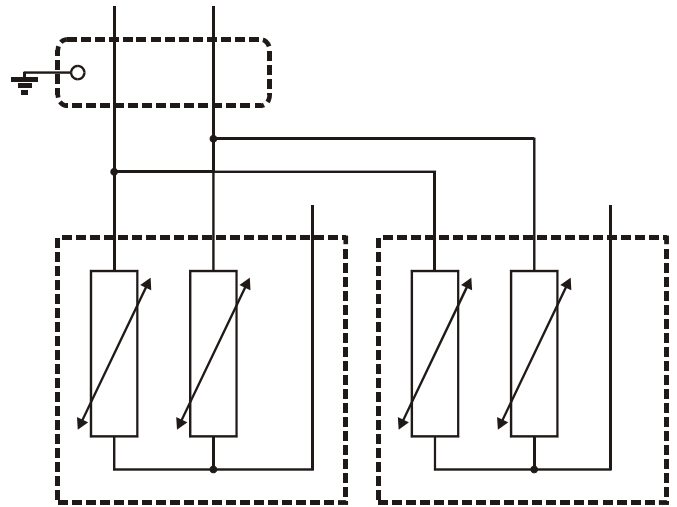**Fig. 3. T7413A, VF20 wiring**

Fig. 4. WPF20 wiring

Fig. 5. Electrical connection establishing mean value with 2 x WPF20

Honeywell