401R and 401T

Stopper type conductivity cell for industrial applications, c/w electrodes protection, graphite or stainless steel electrodes

Conductivity cells with glass fiber filled PP (PP 30% GF) (PVDF or PTFE on request) body and graphite or stainless steel electrodes. These cells are available with K = 1 cm, K = 5 cm, K = 10 cm cell constant and are suitable to measure in the range 0 ÷50000 µS.
These cells can be supplied c/w integral temperature sensor Pt100 or Pt1000 for measure thermo compensation.
These cells have a very simple design that makes quite easy to install them; their body is threaded 1/2" G for direct installation into closed pipelines and tanks, even pressurized (up to 10 bar @ ambient temperature).
Typical use of these cells are drinking water plants, wastewater plants, water softeners, boiler feed water.

Advantages

- **Simple, compact and sturdy execution**
- **Simplified installation**
- **Suitable for direct installation in closed pipelines or tanks**
- **No maintenance requirement**
- **Graphite or stainless steel electrodes c/w electrodes protection**
- **Available c/w integral temperature sensor, Pt100, Pt1000 or other upon request**
- **Operating pressure up to 10 bar @ ambient temperature**
- **Operating temperature 5 ÷ 100 °C**
- **Cell constants: K = 1, K = 5 cm and K = 10 cm**
- **Measuring ranges from 0 to 50000 µS**

Operating principle and realization

The 401R and 401T cells have glass fiber filled PP (PP 30% GF) body (PTFE or PVDF upon request), dimensions are shown in figure. The body itself is threaded, 1/2" G M, for direct process connection.
The electrodes are cylindrical, made in graphite (Mod.401R) or Stainless Steel (Mod.401T), dimensioned and shaped in order to have K = 1 cm, K = 5 cm or K = 10 cm cell constant that in this configuration correspond to the measuring ranges indicated below.
Cable for the connection to the electronic unit is integral, 1, 5 or 10 m long according to selected cell code.
These cells can be supplied c/w integral temperature sensor Pt100, Pt1000, for measure thermo compensation. When the temperature sensor is installed into the SS sheat the sheath itself is used as the solution ground pin.
Series 401R and 401T cells are available with the options listed in the Order Code Breakdown.

Correspondence between measuring ranges and cell constants for 401R (graphite)

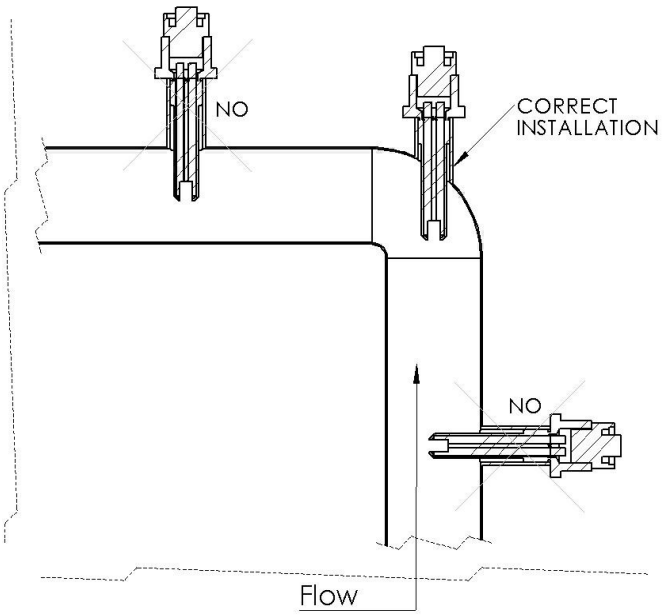
K = 1 cm.....0÷50000 µS
K = 5 cm.....2÷200 µS
K = 10 cm.....2÷200 µS

Correspondence between measuring ranges and cell constants for 401T (SS)

K = 1 cm.....0÷2000 µS
K = 5 cm.....2÷200 µS
K = 10 cm.....2÷200 µS

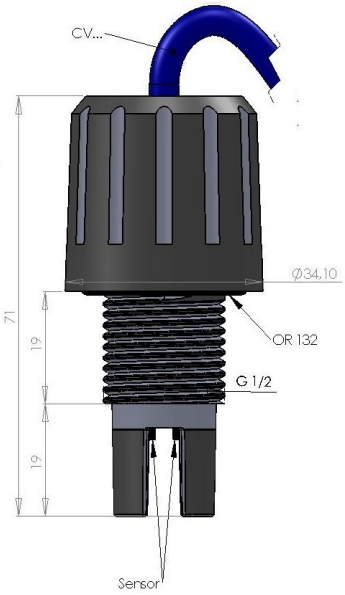
401R and 401T

Installation, Maintenance and Calibration



Thanks to their design these cells are extremely easy to install and do not require any special positioning. The cells should not be installed in locations with high turbulence. Refer to the following drawing.
FS values, cell constant and set-points (min and max) of the instrument are laboratory calibrated. In any case all these values can be modified by the user, as stated in the user manual pertinent to conductivity transmitter. The cell K correction is the only calibration to be performed at start up. Install the cell in the process, then measure process liquid conductivity with a portable conductivity meter recently calibrated and with proper accuracy, then calibrate the slope to obtain the correct reading.
If the portable conductivity meter is not available insert the cell in a solution with known conductivity and calibrate the slope to obtain the correct reading (the instrument should read the calibration solution conductivity value). (Keep in mind that the cell constant value can vary a little when the cell is not installed into its working position).
The electrodes of this sensors are very sturdy and can be mechanically cleaned with a brush.

Outline Dimensions



Technical Specifications

Cell body:.....glass fiber filled PP (PP 30% GF); optionally PVDF and PTFE
Measuring electrodes:.....2, cylindrical, graphite (401R) or SS (401T)
Cell constants and measuring ranges, 401R, graphite electrodes:.....
.....K = 1 cm: 0÷50000 uS; K = 5 cm: 2÷200 uS; ; K = 10 cm: 2÷200 uS;
Cell constants and measuring ranges, 401T, Stainless Steel electrodes:.....
.....K = 1 cm: 0÷2000 uS; K = 5 cm: 2÷200 uS; ; K = 10 cm: 2÷200 uS;
Operating temperature limits:.....5÷100 °C
Operating pressure limits:.....10 bar @ ambient temperature
Integral temperature sensor:.....Pt100 or Pt1000
Process connections:.....threaded, 1/2" G M
Dimensions : .....see drawing
Cable:.....integral, length 1, 5, 10 m

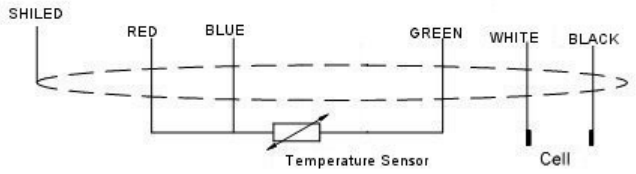
401R and 401T

Wiring, cell without temperature sensor

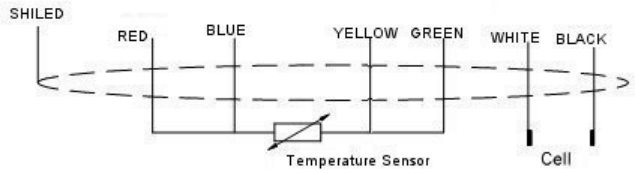
The cell has two wires, brown and blue. Connect them to the terminals for conductivity cell in the electronic unit in use.

Wiring, cell with temperature sensor embedded into cell body, 3 or 4 wires

COLOR	ELEMENT
RED + BLUE	Pt 100
GREEN	Pt 100
WHITE	CELL
BLACK	CELL
SHIELD	GROUND

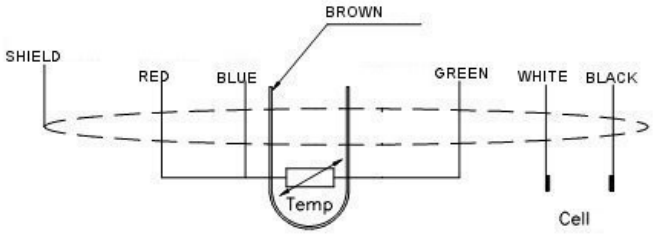


COLOR	ELEMENT
RED + BLUE	Pt 100
YELLOW + GREEN	Pt 100
WHITE	CELL
BLACK	CELL
SHIELD	GROUND

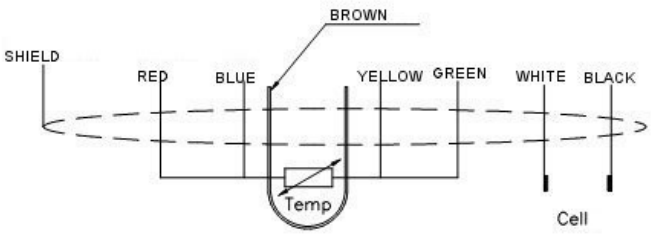


Wiring, cell with temperature sensor into stainless steel sheath, 3 or 4 wires

COLOR	ELEMENT
RED + BLUE	°C/°F
GREEN	°C/°F
WHITE	CELL
BLACK	CELL
BROWN	EARTH
SHIELD	GROUND



COLOR	ELEMENT
RED + BLUE	°C/°F
GREEN + YELLOW	°C/°F
WHITE	CELL
BLACK	CELL
BROWN	EARTH
SHIELD	GROUND



Brown wire il connected to the SS sheath of the temperature sensor. It can be used for solution ground contact by wiring it to the instrument ground terminal.

401R and 401T

Order code breakdown

Conductivity cells 401	x	x	x	x	x	x	x	x	x
Type of cell									
Stopper type c/w electrodes protection, graphite electrodes	R								
Stopper type c/w electrodes protection, stainless steel electrodes	T								
Cell constant									
k = 1 cm		3							
k = 5 cm		4							
k = 10 cm		5							
Temperature sensing element									
Not included			A						
Pt100 sensor inside SS sheath			B						
Pt100 sensor embedded inside cell body			E						
Pt1000 sensor embedded inside cell body			F						
Other sensor on request embedded inside cell body			X						
Cell body material									
PTFE				2					
PVDF				4					
PP 30% GF				5					
Other				9					
Process connections									
Threaded 1/2” GAS M					C				
Other upon request					Z				
Fixed code						0			
Cable and connector									
Integral cable, length 1 m							A		
Integral cable, length 5 m							B		
Integral cable, length 10 m							C		
Other upon request							Z		
Connector on intrusmemt side									
No connector								0	
Other on request								9	
Fixed code									A

Optional accessories

Known conductivity standard solution, 250 ml bottle.....T/401-A

Specify desired conductivity value at order; typical values are: 1,278 mS, 11,67 mS e 102,09 mS, however solution with other conductivity values are available upon request.