

Table 5.1.2 — Instrumentation device or function symbols, miscellaneous

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.1.

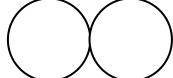
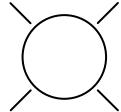
No	Symbol	Description
1		<ul style="list-style-type: none"> • Signal processing function: • Locate in upper right or left quadrant of symbols above. • Attach to symbols above where affected signals are connected. • Insert signal processing symbol from Table 5.6 • Expand symbol by 50% increments for larger function symbols.
2		<ul style="list-style-type: none"> • Panel-mounted patchboard plug-in point. • Console matrix point. • C-12 equals patchboard column and row respectively, as an example.
3	(7) (8) 	<ul style="list-style-type: none"> • Generic interlock logic function. • Undefined interlock logic function.
4	(7) (8) 	<ul style="list-style-type: none"> • 'AND' interlock logic function.
5	(7) (8) 	<ul style="list-style-type: none"> • 'OR' interlock logic function.
6		<ul style="list-style-type: none"> • Instruments or functions sharing a common housing. • It is not mandatory to show a common housing. • Notes shall be used to identify instruments in common housings not using this symbol.
7		<ul style="list-style-type: none"> • Pilot light. • Circle shall be replaced with any symbol from column D in Table 5.1.1 if location and accessibility needs to be shown.

Table 5.2.1 — Measurement symbols: primary elements and transmitters

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.2.

No	Symbol	Description
1	(1a) (2) 	<ul style="list-style-type: none"> Generic primary element, bubble format. Notation (*) from Table 5.2.2 should be used to identify type of element. Connect to process or other instruments by symbols from Tables 5.3.1 and 5.3.2. Insert in or on process flow line, vessel, or equipment.
2	(1a) (2) (3) 	<ul style="list-style-type: none"> Transmitter with integral primary element, bubble format. Notation (*) from Table 5.2.2 should be used to identify type of element. Connect to process or other instruments by symbols from Tables 5.3.1 and 5.3.2. Insert in or on process flow line, vessel, or equipment.
3	(1a) (2) (3) 	<ul style="list-style-type: none"> Transmitter with close coupled primary element, bubble format Notation (*) from Table 5.2.2 should be used to identify type of element. Connecting line shall be equal to or less than 0.25 inches (6 millimeters). Connect to process or other instruments by symbols from Tables 5.3.1 and 5.3.2. Insert element in or on process flow line, vessel, or equipment.
4	(1a) (3) 	<ul style="list-style-type: none"> Transmitter with remote primary element, bubble format. Notation (*) from Table 5.2.2 should be used to identify type of element. Connecting line shall be equal to or greater than 0.5 inches (12 millimeters). Connect to process or other instruments by symbols from Tables 5.3.1 and 5.3.2. Insert element in or on process flow line, vessel, or equipment.
5	(1b) (3) 	<ul style="list-style-type: none"> Transmitter with integral primary element inserted in or on process flow line, vessel, or equipment, bubble/graphic format. Insert primary element symbol from Table 5.2.3 at #. Connect to other instruments by symbols from Table 5.3.2.
6	(1b) (3) 	<ul style="list-style-type: none"> Transmitter with close-coupled primary element inserted in or on process flow line, vessel, or equipment, bubble/graphic format. Insert primary element symbol from Table 5.2.3 at #. Connecting line shall be equal to or less than 0.25 inches (6 millimeters). Connect to other instruments by symbols from Table 5.3.2.
7	(1b) (3) 	<ul style="list-style-type: none"> Transmitter with remote primary element inserted in or on process flow line, vessel, or equipment, bubble/graphic format. Insert primary element symbol from Table 5.2.3 at #. Connecting line may be any signal line from Table 5.2.3. Connecting line shall be equal to or greater than 0.5 inches (12 millimeters). Connect to other instruments by symbols from Table 5.3.2.

Table 5.2.2 — Measurement symbols: measurement notations (4)

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.2

Analysis							
AIR	= Excess air	H2O	= Water	O2	= Oxygen	UV	= Ultraviolet
CO	= Carbon monoxide	H2S	= Hydrogen sulfide	OP	= Opacity	VIS	= Visible light
CO2	= Carbon dioxide	HUM	= Humidity	ORP	= Oxidation reduction	VISC	= Viscosity
COL	= Color	IR	= Infrared	pH	= Hydrogen ion	=	=
COMB	= Combustibles	LC	= Liquid chromatograph	REF	= Refractometer	=	=
COND	= Elec. conductivity	MOIST	= Moisture	RI	= Refractive index	=	=
DEN	= Density	MS	= Mass spectrometer	TC	= Thermal conductivity	=	=
GC	= Gas chromatograph	NIR	= Near infrared	TDL	= Tunable diode laser	=	=
Flow							
CFR	= Constant flow regulator	OP	= Orifice plate	PT	= Pitot tube	VENT	= Venturi tube
CONE	= Cone	OP-CT	= Corner taps	PV	= Pitot venturi	VOR	= Vortex Shedding
COR	= Coriolis	OP-CQ	= Circle quadrant	SNR	= Sonar	WDG	= Wedge
DOP	= Doppler	OP-E	= Eccentric	SON	= Sonic	=	=
DSON	= Doppler sonic	OP-FT	= Flange taps	TAR	= Target		
FLN	= Flow nozzle	OP-MH	= Multi-hole	THER	= Thermal		
FLT	= Flow tube	OP-P	= Pipe taps	TTS	= Transit time sonic		
LAM	= Laminar	OP-VC	= Vena contracta taps	TUR	= Turbine		
MAG	= Magnetic	PD	= Positive displacement	US	= Ultrasonic		
Level							
CAP	= Capacitance	GWR	= Guided wave radar	NUC	= Nuclear	US	= Ultrasonic
d/p	= Differential pressure	LSR	= Laser	RAD	= Radar	=	=
DI	= Dielectric constant	MAG	= Magnetic	RES	= Resistance	=	=
DP	= Differential pressure	MS	= Magnetostrictive	SON	= Sonic	=	=
Pressure							
ABS	= Absolute	MAN	= Manometer	VAC	= Vacuum		
AVG	= Average	P-V	= Pressure-vacuum			=	=
DRF	= Draft	SG	= Strain gage			=	=
Temperature							
BM	= Bi-metallic	RTD	= Resistance temp detector	TCK	= Thermocouple type K	TRAN	= Transistor
IR	= Infrared	TC	= Thermocouple	TCT	= Thermocouple type T	=	=
RAD	= Radiation	TCE	= Thermocouple type E	THRM	= Thermistor	=	=
RP	= Radiation pyrometer	TCJ	= Thermocouple type J	TMP	= Thermopile	=	=
Miscellaneous							
Burner, Combustion		Position		Quantity		Radiation	
FR	= Flame rod	CAP	= Capacitance	PE	= Photoelectric	α	= Alpha radiation
IGN	= Igniter	EC	= Eddy current	TOG	= Toggle	β	= Beta radiation
IR	= Infrared	IND	= Inductive			γ	= Gamma radiation
TV	= Television	LAS	= Laser			n	= Neutron radiation
UV	= Ultraviolet	MAG	= Magnetic				=
		MECH	= Mechanical				=
		OPT	= Optical				=
		RAD	= Radar				=
							=
Speed		Weight, Force					
ACC	= Acceleration	LC	= Load cell				
EC	= Eddy current	SG	= Strain gauge				
PROX	= Proximity	WS	= Weigh scale				
VEL	= Velocity						

Table 5.2.3 — Measurement symbols: primary elements

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.2.

No		Symbol (4)	Description
Analysis	1		<ul style="list-style-type: none"> Conductivity, moisture, etc. Single element sensing probe.
Analysis	2		<ul style="list-style-type: none"> pH, ORP, etc. Dual element sensing probe.
Analysis	3		<ul style="list-style-type: none"> Fiberoptic sensing probe.
Burner	4		<ul style="list-style-type: none"> Ultraviolet flame detector. Television flame monitor.
Burner	5		<ul style="list-style-type: none"> Flame rod flame detector.
Flow	6		<ul style="list-style-type: none"> Generic orifice plate. Restriction orifice.
Flow	7		<ul style="list-style-type: none"> Orifice plate in quick-change fitting.
Flow	8		<ul style="list-style-type: none"> Concentric circle orifice plate. Restriction orifice.
Flow	9		<ul style="list-style-type: none"> Eccentric circle orifice plate.
Flow	10		<ul style="list-style-type: none"> Circle quadrant orifice plate.
Flow	11		<ul style="list-style-type: none"> Multi-hole orifice plate
Flow	12		<ul style="list-style-type: none"> Generic venturi tube, flow nozzle, or flow tube. Notation from Table 5.2.2 required at (*) if used for more than one type.
Flow	13		<ul style="list-style-type: none"> Venturi tube.
Flow	14		<ul style="list-style-type: none"> Flow nozzle.
Flow	15		<ul style="list-style-type: none"> Flow tube.

Table 5.2.3 — Measurement symbols: primary elements

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.2.

No	Symbol (4)	Description
Flow 16		<ul style="list-style-type: none"> Integral orifice plate.
Flow 17		<ul style="list-style-type: none"> Standard pitot tube.
Flow 18		<ul style="list-style-type: none"> Averaging pitot tube.
Flow 19		<ul style="list-style-type: none"> Turbine flowmeter. Propeller flowmeter.
Flow 20		<ul style="list-style-type: none"> Vortex shedding flowmeter
Flow 21		<ul style="list-style-type: none"> Target flowmeter.
Flow 22	(4) a)	<ul style="list-style-type: none"> Magnetic flowmeter.
Flow 23	(4) a)	<ul style="list-style-type: none"> Thermal mass flowmeter.
Flow 24		<ul style="list-style-type: none"> Positive displacement flowmeter.
Flow 25		<ul style="list-style-type: none"> Cone meter. Annular orifice meter.
Flow 26		<ul style="list-style-type: none"> Wedge meter.
Flow 27		<ul style="list-style-type: none"> Coriolis flowmeter.
Flow 28		<ul style="list-style-type: none"> Sonic flowmeter. Ultrasonic flowmeter.
Flow 29		<ul style="list-style-type: none"> Variable area flowmeter.
Flow 30		<ul style="list-style-type: none"> Open channel weir plate.

Table 5.2.3 — Measurement symbols: primary elements

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.2.

No		Symbol (4)	Description
Flow	31		<ul style="list-style-type: none"> Open channel flume.
Level	32		<ul style="list-style-type: none"> Displacer internally mounted in vessel.
Level	33		<ul style="list-style-type: none"> Ball float internally mounted in vessel. May be installed through top of vessel.
Level	34		<ul style="list-style-type: none"> Radiation, single point. Sonic.
Level	35		<ul style="list-style-type: none"> Radiation, multi-point or continuous.
Level	36		<ul style="list-style-type: none"> Dip tube or other primary element and stilling well. May be installed through side of vessel. May be installed without stilling well.
Level	37		<ul style="list-style-type: none"> Float with guide wires. Location of readout should be noted, at grade, at top, or accessible from a ladder. Guide wires may be omitted.
Level	38		<ul style="list-style-type: none"> Insert probe. May be through top of vessel.
Level	39		<ul style="list-style-type: none"> Radar.
Pressure	40		<ul style="list-style-type: none"> Strain gage or other electronic type sensor. Notation (*) from Table 5.2.2 should be used to identify type of element. Connection symbols 6, 7, 8, or 9 in Table 5.3.1 are used if connection type is to be shown. Bubble may be omitted if connected to another instrument.

Table 5.2.3 — Measurement symbols: primary elements

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.2.

No		Symbol (4)	Description
Temperature	41		<ul style="list-style-type: none"> • Generic element without thermowell. • Notation (*) should be used to identify type of element, see Table 5.2.2. • Connection symbols 6, 7, 8, or 9 in Table 5.3.1 are used if connection type is to be shown. • Bubble may be omitted if connected to another instrument.

Table 5.2.4 — Measurement symbols: secondary instruments

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.2.

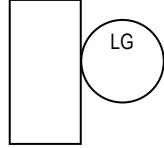
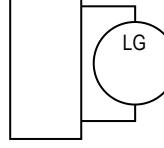
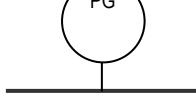
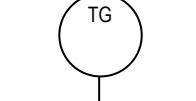
No		Symbol (4)	Description
Flow	1		<ul style="list-style-type: none"> • Sight glass.
Level	2		<ul style="list-style-type: none"> • Gage integrally mounted on vessel. • Sight glass.
Level	3		<ul style="list-style-type: none"> • Gage glass externally mounted on vessel or standpipe. • Multiple gages may be shown as one bubble or one bubble for each section. • Use connection 6, 7, 8, or 9 in Table 5.3.1 if connection type is to be shown.
Pressure	4		<ul style="list-style-type: none"> • Pressure gage. • Use connection 6, 7, 8, or 9 in Table 5.3.1 if connection type is to be shown.
Temperature	5		<ul style="list-style-type: none"> • Thermometer. • Use connection 6, 7, 8, or 9 in Table 5.3.1 if connection type is to be shown.

Table 5.2.5 — Measurement symbols: auxiliary and accessory devices

Note: Numbers in parentheses refer to explanatory notes in Clause 5.3.2.

No		Symbol (4)	Description
Analysis	1		<ul style="list-style-type: none"> • Sample insert probe, flanged. • Sample well, flanged. • Use connection 7, 8, or 9 in Table 5.3.1 if flange is not used.
Analysis	2		<ul style="list-style-type: none"> • Sample conditioner or other analysis accessory, flanged. • Represents single or multiple devices. • Use connection 7, 8, or 9 in Table 5.3.1 if flange is not used.
Flow	3		<ul style="list-style-type: none"> • Flow straightening vanes. • Flow conditioning element.
Flow	4		<ul style="list-style-type: none"> • Instrument purge or flushing fluid. • Instrument purge or flushing device or devices. • Show assembly details on drawing legend sheet.
Pressure	5		<ul style="list-style-type: none"> • Diaphragm pressure seal, flanged, threaded, socket welded, or welded. • Diaphragm chemical seal, flanged, threaded, socket welded, or welded. • Use connection 6, 7, 8, or 9 in Table 5.3.1 if connection type is to be shown.
Pressure	6		<ul style="list-style-type: none"> • Diaphragm pressure seal, welded. • Diaphragm chemical seal, welded.
Temperature	7		<ul style="list-style-type: none"> • Thermowell, flanged. • Test well, flanged. • Bubble may be omitted if connected to another instrument. • Use connection 7, 8, or 9 in Table 5.3.1 if flange is not used.