



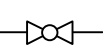
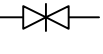
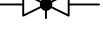
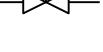
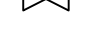
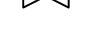
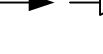
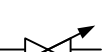








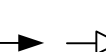
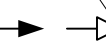
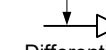







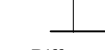






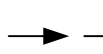

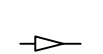
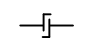
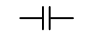
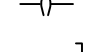
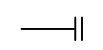
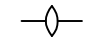
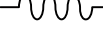

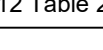
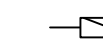

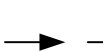
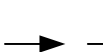
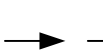


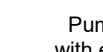

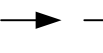
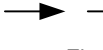

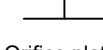

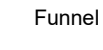



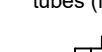

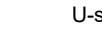
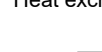

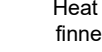



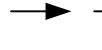
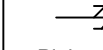
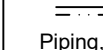
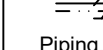




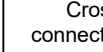



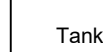


























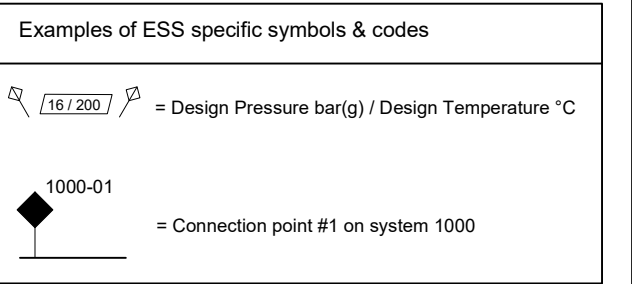
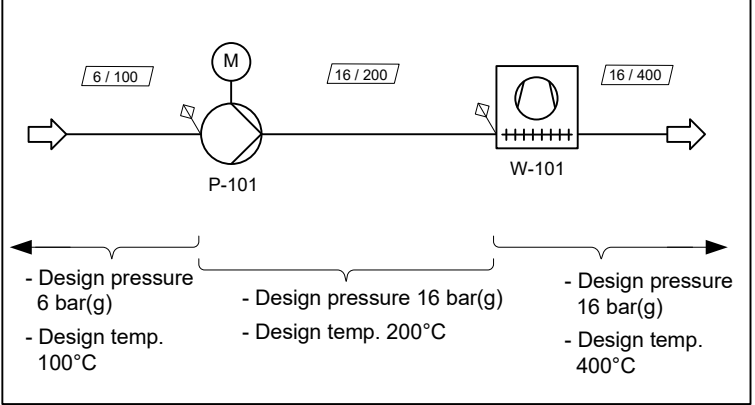
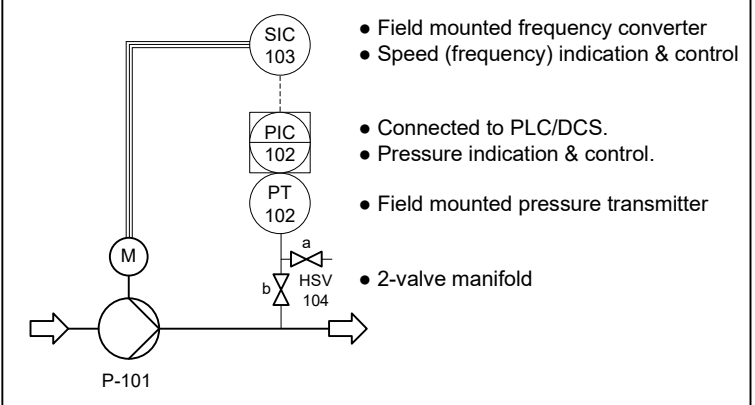
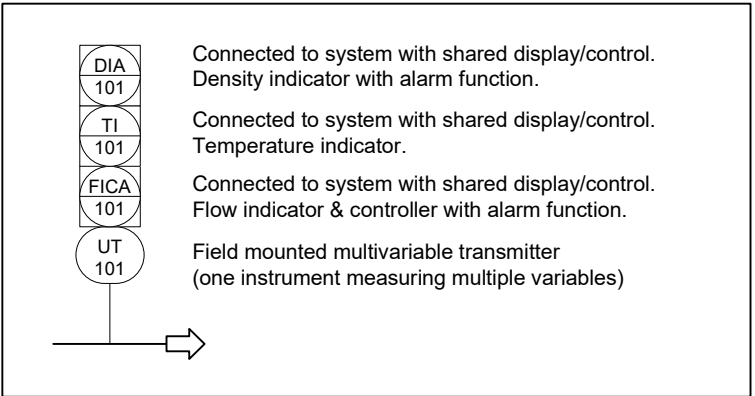
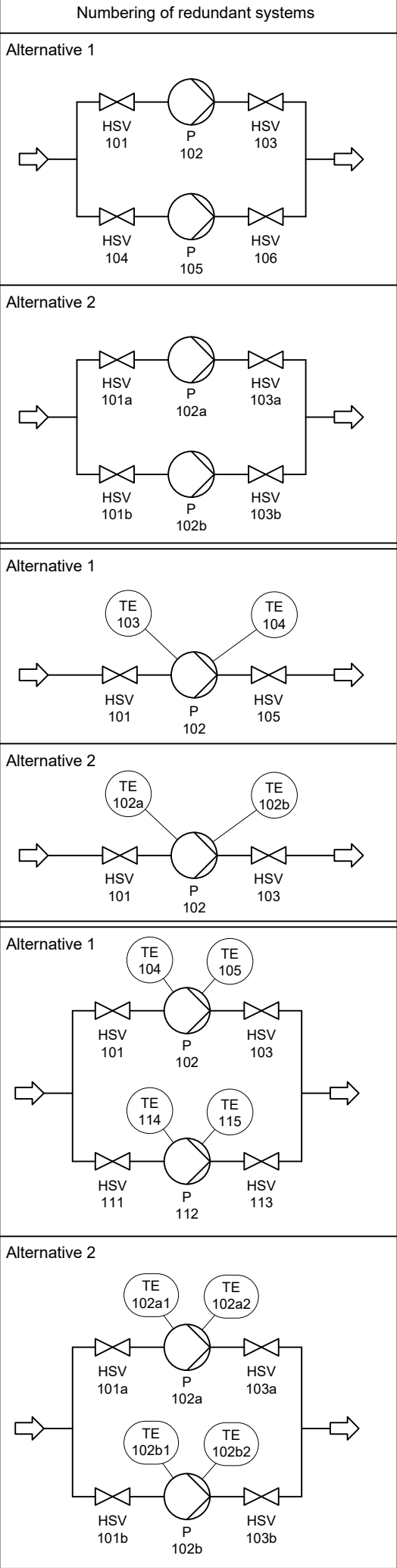
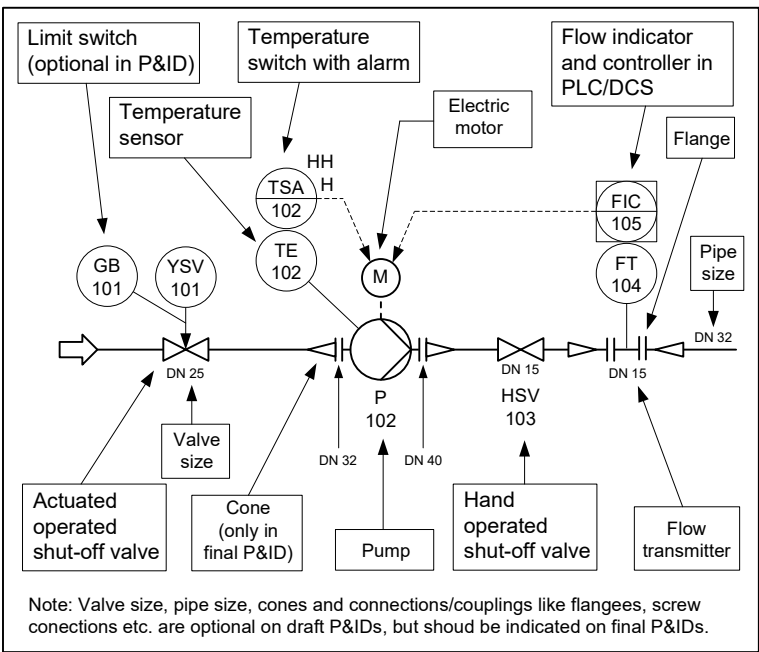
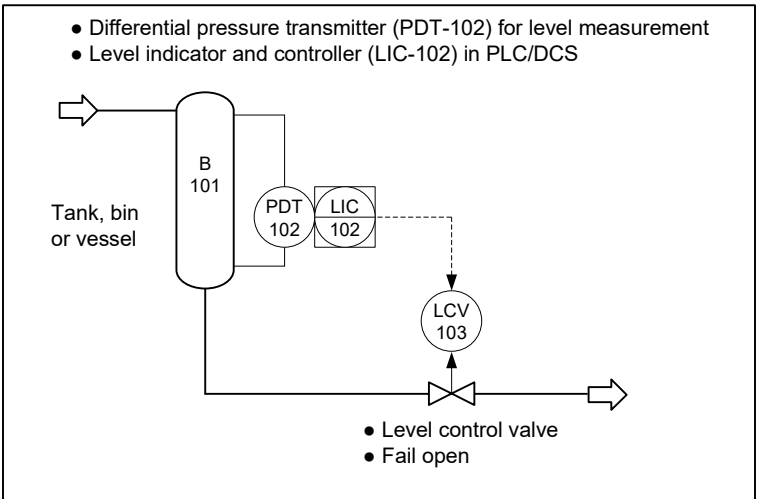
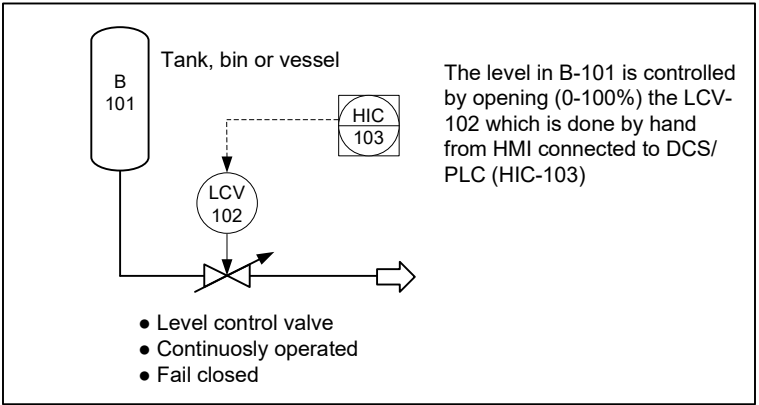
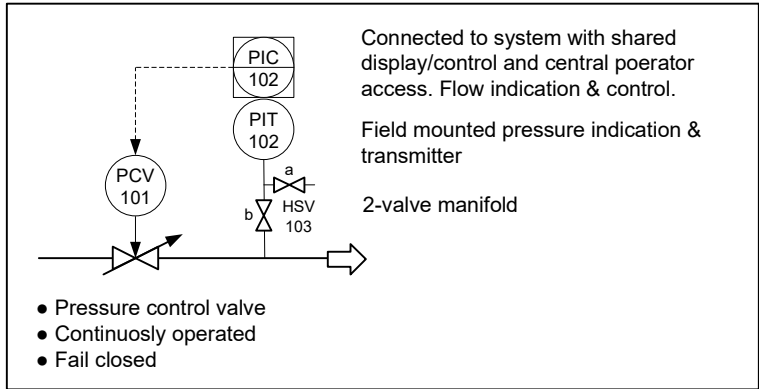



Graphical symbols (SS-EN ISO 10628-2:2012 Table 2)

<div>Valve (general)</div> <div>Valve angle type (general)</div> <div>Valve 3-way type (general)</div> <div>Globe valve</div> <div>Ball valve</div> <div>Gate valve</div> <div>Butterfly valve</div> <div>Valve, multi turn</div> <div>Valve, needle type</div> <div>Check valve (general)</div> <div>Float valve</div> <div>Valve, control type continuously operated</div> <div>Safety or relief valve, spring loaded</div> <div><div>YSV 000</div><div>Actuator operated shut-off valve (general)</div></div> <div><div>YSV 000</div><div>Actuator operated shut-off valve, fail open</div></div>	<div><div>YSV 000</div><div>Actuator operated shut-off valve, fail closed</div></div> <div><div>GB 000 YSV 000</div><div>Actuator operated shut-off valve, fail closed with limit switch</div></div> <div><div>PCV 000</div><div>Pressure control valve, continuously operated, fail closed</div></div> <div><div>PCV 000</div><div>Pressure control valve, fail open</div></div> <div><div>PCV 000</div><div>Pressure reducing regulator with external tap</div></div> <div><div>PCV 000</div><div>Pressure reducing regulator with internal tap</div></div> <div><div>PCV 000</div><div>Back pressure regulator with internal tap</div></div> <div><div>PDCV 000</div><div>Differential pressure regulator with external taps</div></div>	<div><div>PI 000</div><div>Pressure indicator</div></div> <div><div>PT 000</div><div>Pressure transmitter</div></div> <div><div>PIT 000</div><div>Pressure indicator and transmitter</div></div> <div><div>PIS 000</div><div>Pressure indicator and switch</div></div> <div><div>PISA 000</div><div>Pressure indicator with switch and high and low alarm</div></div> <div><div>PISAZ 000</div><div>Pressure indicator with switch, high, very high and low, very low alarm with safety function</div></div> <div><div>PDT 000</div><div>Differential pressure transmitter</div></div> <div><div>PDIS 000</div><div>Differential pressure indicator and switch</div></div>	<div><div>Liquid filter, general</div></div> <div><div>Gas filter, general</div></div> <div><div>Liquid bed filter, ion exchange type</div></div> <div><div>Rupture disk, general</div></div> <div><div>Screening device, strainer (general)</div></div> <div><div>Strainer</div></div> <div><div>Separator, cyclone type</div></div> <div><div>Steam trap</div></div> <div><div>Reducer</div></div> <div><div>Coupling (general)</div></div> <div><div>Flanged connection</div></div> <div><div>Screwed connection</div></div> <div><div>End screwed</div></div> <div><div>End flanged</div></div> <div><div>Compensator</div></div> <div><div>Flexible hose</div></div> <div><div>Viewing glass</div></div>	<div><div>Static mixer</div></div> <div><div>Scilencer</div></div> <div><div>Pump general</div></div> <div><div>Centrifugal pump</div></div> <div><div>Positive-displacement pump</div></div> <div><div>Membrane pump</div></div> <div><div>Pump, general, with electric motor</div></div> <div><div>Compressor, general Vacuum pump, general</div></div> <div><div>Compressor, screw type</div></div> <div><div>Ejector, general</div></div> <div><div>Blower, general Fan, general</div></div> <div><div>Orifice plate</div></div> <div><div>Blind disc</div></div> <div><div>Funnel</div></div> <div><div>Vent</div></div>	<div><div>Heat exchanger (general), condenser</div></div> <div><div>Heat exchanger (general)</div></div> <div><div>Heat exchanger with straight tubes (fixed-tube plates)</div></div> <div><div>Heat exchanger of floating head type</div></div> <div><div>Heat exchanger with U-shaped tubes</div></div> <div><div>Heat exchanger of plate type</div></div> <div><div>Finned tube heat exchanger</div></div> <div><div>Heat exchanger with finned tube and fan</div></div> <div><div>Flame arrestor</div></div> <div><div>Flame arrestor Explosion-proof</div></div> <div><div>Flame arrestor detonation-proof</div></div> <div><div>Flame arrestor fire-resistant</div></div> <div><div>Flow motion in direction of arrow</div></div>	<div><div>Piping, thermal insulated</div></div> <div><div>Piping, heated or cooled</div></div> <div><div>Piping, heated or cooled and insulated</div></div> <div><div>Piping, jacked</div></div> <div>SS-EN ISO 10628-1:2015</div> <div><div>Limit</div></div> <div><div>Connection between two pipes</div></div> <div><div>Crossing pipes, no connection between pipes</div></div> <div><div>Arrow for inlet or outlet of essential substances</div></div>	<div><div>Gas cylinder</div></div> <div><div>Barrel, drum</div></div> <div><div>Tank, vessel (general)</div></div> <div><div>Tank, vessel with dished ends (general)</div></div> <div><div>Insulated tank with dished ends</div></div>
Graphical symbols for instrument location (ISO 14617-6:2002)							
	Field mounted	Central control room /central panel. Operator access	Local control room / local panel. Operator access	Alternatives if more space is required for letter codes			
Discrete instruments							
Shared display, shared control							
Computer function							
Programmable logic control, PLC							
Title Graphical symbols & letter codes for process plants according to ISO 10628 and ISO 14617		Approved by -		Signature		 EUROPEAN SPALLATION SOURCE	
Reviewed by -		Signature					
Type of drawing Guideline	Date (this version) 2016-07-05	Size A3	Scale -	Drawn by / changed by L. Emås	Signature	Drawing No ESS-0033888	Revision 1 (11)




Title				Approved by	Signature	
Examples of graphical symbols & letter codes for process plants according to ISO 10628 and ISO 14617				-	-	
Type of drawing	Date (this version)	Size	Scale	Drawn by / changed by	Signature	Drawing No
Guideline	2016-07-05	A3	-	L. Emás		ESS-0033888
						Revision
						1 (11)

Letter codes for instument functions (ISO 14617-6:2002 Chapter 7.3.1)					
1 st letter Initiating or measured variable	ESS choice	Modifier to first letter. Used as 2 nd letter	ESS choice	Function 3 rd letter if modifier is used, otherwise used as 2 nd , 3 rd , 4 th letter,	ESS choice
A: B: C: D: Density E: Electric variable F: Flow rate G: Position H: Hand I: J: Power K: Time L: Level M: Moisture, humidity N:User's choice O: User's choice P:Pressure, vacuum Q: Quantity R: Radiation S: Speed, frequency T: Temperature U: Multivariable V: User's choice W: Weight, force x: Unclassified Y: User's choice Z: Number of events	X	A: B: C: D: Difference E: F: Ratio, fraction G: H: I: J: Scanning K: Time rate of change L: M: Momentarily N: O: P: Q: Integral, total R: S: T: U: V: W: Multiplying X: Y: Z:		A: Alarming B: Displaying discrete state (i.e. open/closed, stop/run) C: Controlling D: E: Sensing F: G: Viewing H: I: Indicating J: K: L: M: N: User's choice O: P: Connection of test point Q: Integrating, summing R: Registering, recording S: Switching T: Transmitting U: Multi-function V: Impact on process by valve, pump etc. W: X: Unclassified Y: Converting, computing Z: Emergency or safety acting	
ESS choice		ESS choice		ESS choice	
Y: Actuated operated		None		None	
When two or more code letters for function occur, the order of sequence shall be: G, I, B, R, C, T, X, Y, Q, S, Z, A					

Letter codes for apparatus and machinery (ISO 10628:2000 annex D.2)	
A: Equipment or machine not classified by other letter B: Vessel, tank, bin C: Chemical reactor D: Steam/gas generator F: Filter, separator G: Gears H: Lifting, conveying K: Columns M: Electrical motor	P: Pump R: Agitator, mixer, stirrer S: Centrifuges T: Driers V: Compressor, vacuum pump, blower, fan W: Heat Exchanger X: Feeding, distribution Y: Drives, not electric motors Z: Cruching/grinding machines


Letter codes for set values (ISO 14617-6:2002 Chapter 7.3.2)	
	High
	Very high
	Extremely high
	Low
	Very low
	Extremely low
	High or low

Title Letter codes for process plants according to ISO 10628 and ISO 14617				Approved by -	Signature	 EUROPEAN SPALLATION SOURCE	
				Reviewed by -	Signature		
Type of drawing Guideline	Date (this version) 2016-07-05	Size A3	Scale -	Drawn by / changed by L. Emás	Signature	Drawing No ESS-0033888	Revision 1 (11)

Examples of letter codes for instrument functions (according to ISO 14617-6:2002 Chapter 7.3.1)																		
1 st letter Initiating or measured variable + modifier		Controllers			Readout devises		Transmitters			Control valve	Shut-off valve	Switch	Switch & alarm	Switch, alarm & safety acting	Computing devices	Primary element (sensor)	Test point	Viewing glass
		Recording	Indicating	Blind	Recording	Indicating	Recording	Indicating	Blind									
A																		
B																		
C																		
D	Density	DRC	DIC	DC	DR	DI	DRT	DIT	DT	FCV			DS	DSA	DSZA	DY	DE	DP
E	Electric variable	ERC	EIC	EC	ER	EI	ERT	EIT	ET				ES	ESA	ESZA	EY	EE	
F	Flow rate	FRC	FIC	FC	FR	FI	FRT	FIT	FT				FS	FSA	FSZA	FY	FE	FP
FQ	Flow Quantity	FQRC	FQIC	FQC	FQR	FQI	FQRT	FQIT	FQT				FQS	FQSA	FQSZA	FQY	FQE	
FF	Flow ratio	FFRC	FFIC	FFC	FFR	FFI	FFRT	FFIT	FFT							FFY	FFE	
G	Position	GRC	GIC	GC	GR	GI	GRT	GIT	GT	HCV	HSV		GS	GSA	GSZA	GY	GE	
H	Hand		HIC	HC														
I																		
J	Power	JRC	JIC	JC	JR	JI	JRT	JIT	JT				JS	JSA	JSZA	JY	JE	
K	Time	KRC	KIC	KC	KR	KI	KRT	KIT	KT	LCV			KS	KSA	KSZA	KY		
L	Level	LRC	LIC	LC	LR	LI	LRT	LIT	LT				LS	LSA	LSZA	LY	LE	LP
M	Moisture, humidity	MRC	MIC	MC	MR	MI	MRT	MIT	MT				MS	MSA	MSZA	MY	ME	MP
N	User's choise																	
O	User's choice																	
P	Pressure, vacuum	PRC	PIC	PC	PR	PI	PRT	PIT	PT	PCV			PS	PSA	PSZA	PY	PE	PP
PD	Pressure differential	PDR	PDI	PDT						PDCV			PDS	PDSA	PDSZA	PDY	PDE	PDP
Q	Quantity	QRC	QIC	QC	QR	QI	QRT	QIT	QT				QS	QSA	QSZA	QY	QE	
R	Radiation	RRC	RIC	RC	RR	RI	RRT	RIT	RT				RS	RSA	RSZA	RY	RE	RP
S	Speed, frequency	SRC	SIC	SC	SR	SI	SRT	SIT	ST				SS	SSA	SSZA	SY	SE	
T	Temperature	TRC	TIC	TC	TR	TI	TRT	TIT	TT	TCV			TS	TSA	TSZA	TY	TE	TP
TD	Temperature differential	TDR	TDI	TDT						TDCV			TDS	TDSA	TDSZA	TDY	TDE	TDP
U	Multivariable																	
V	User's choice																	
W	Weight, force	WRC	WIC	WC	WR	WI	WRT	WIT	WT	WCV			WS	WSA	WSZA	WY	WE	
WD	Weight, force differential	WDR	WDI	WDT						WDCV			WDS	WDSA	WDSZA	WDY	WDE	
X	Unclassified																	
Y	Actuated operated (User's choice)										YSV							
Z	Number of events	ZRC	ZIC	ZC	ZR	ZI									ZY	ZE		
When two or more code letters for function occur, the order of sequence shall be: G, I, B, R, C, T, X, Y, Q, S, Z, A																		
Note: This table is not all inclusive.																		

Basic ruels	
1)	The letter code for an instrument or function may not exceed 6 characters.
2)	The number following the letter code shall consist of 3 digits, and may be followed by additional 1 to 3 charachters to identify components in redundant systems.
3)	Line thickness for - non main piping - "balloons" (including the connection line) with letter code - line indicating controlling loop shall be thinner (~ ½ the thickness) than lines for main piping.

Other possible combinations according to ISO 14617-6	
Controllers	
PICA	Pressure indication, control and alarm
PDICA	Differential pressure indication, control and alarm
SC	Speed control (e.g. frequency converter)
HIC	Hand operated controller with indication
Valves	
PZ	Pressure safety valve (relief valve)
FSV	Check valve (non-return valve)
HSV	Hand operated shut-off valve
YSV	Actuator operated shut-off valve
Position	
GB	Limit (proximity) switch on valve

Title Examples of letter codes for process plants according to ISO 10628 and ISO 14617				Approved by -	Signature	 EUROPEAN SPALLATION SOURCE
				Reviewed by -	Signature	
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