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BUREAU OF INDIAN STANDARDS

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भारतीय मानक **मसौदा**

प्रक्रम प्रवाह आरेखों, नलतंत्र और मापयंत्रण आरेखों हेतु ग्राफीय प्रतीकों की अनुशंसा

(आई एस 3232 का *तीसरा पुनरीक्षण*)

Draft *Indian Standard*

RECOMMENDATIONS ON GRAPHICAL SYMBOLS FOR PROCESS FLOW DIAGRAMS, PIPING AND INSTRUMENTATION DIAGRAMS

(Third Revision of IS 3232 *)*

ICS 01.080.30; 23.040.01

Chemical Engineering Plants and related Equipment Sectional Committee, MED 17	**Last date for receipt of comments is 21 August 2022**

FOREWORD

(*Formal clause to be added later*)

This Indian Standard was first published in 1965 and then revised in 1976 and 1999. This standard is being revised again to keep pace with the latest technological developments and international practices. In this revision, the following major changes have been made:

1) A reference clause has been added mentioning the latest version of all the referred standards.
2) Editorial corrections have been done.

Process flow diagrams are widely used in chemical industry as an aid to show basic items of major equipments and their relations to one another in the process scheme. The important flow lines are

indicated as connecting items of equipments and help to describe how the process operates.

Piping and instrumentation diagrams are used in the chemical industry to indicate all important aspects such as:

— All equipment items
— All instrument items
— All pipelines
— Important aspects such as insulations, slopes, equipment elevations, etc

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

This standard lays down symbols that are to be used while preparing process flow diagrams as well as piping and instrumentation diagrams in order to represent the major requirements of plant or units in the chemical industry.

2 SYMBOLS

2.1 The symbols indicated here represent only major items of plants. Two or more of the basic symbols may be combined to represent composite units.

2.2 Requirement of symbols has been covered in the following Sections:

Section 01 General

Section 02 Process quantities

Section 03 Piping

Section 04 Valves

Section 05 Fittings

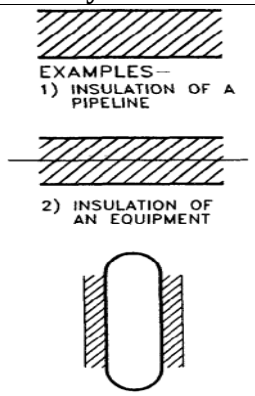
Section 06 Instruments

Section 07 Pumps

Section 08 Compressors

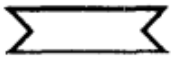
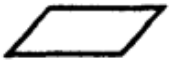
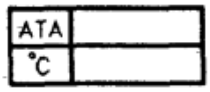
Section 09 Heating and cooling arrangements

SECTION 01 GENERAL

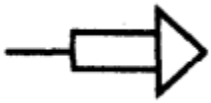
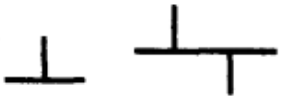
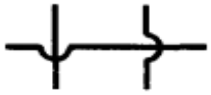
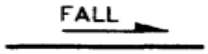
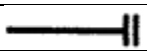
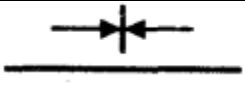
SYM No.	Description	Symbols	Remarks
0101	Insulation or Tracing		Insulation or tracing for equipment and lines are generally not shown symbolically in PFD'S and P & ID'S. In P&IDS, the letters indicating the type of insulation or tracing are placed on top of the line

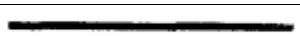
			with or without line number.

SECTION 02 PROCESS QUANTITIES

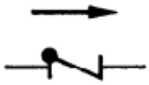
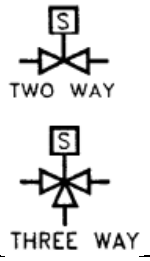
0201	Liquid Flow		Place numerical quantities specified within the symbol
0202	Gas Flow		
0203	Pressure and temperature		

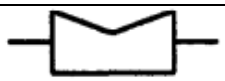
SECTION 03 PIPING

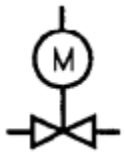
0301	Inflow Line		Identify by name
0302	Outflow Line		Identify by name
0303	Connecting Line		
0304	Cross Over Line		
0305	Direction of Process Flow		
0306	Slope of a Process Line		Indicates direction but not limits. Degrees are to be shown separately
0307	Dead End		
0308	Buried Line		
0309	Vendor Limit Line		
0310	Tracing		Form of heating to be indicated by initial letter
0311	Change of Pipe Specification		
0312	Centre Line		
0313	Coil		

0314	Process Line		
0315	Jacketted Line		

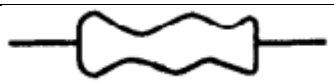
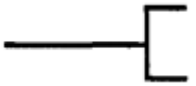
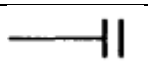
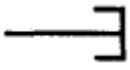
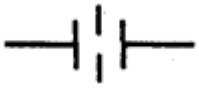
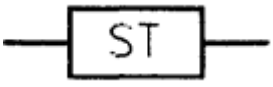
SECTION 04 VALVE

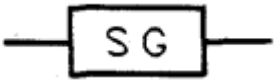
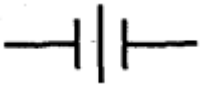
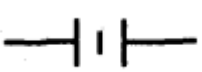
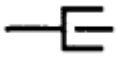
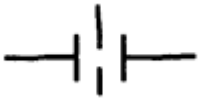
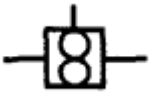
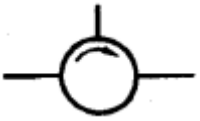
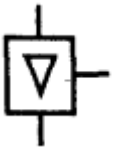
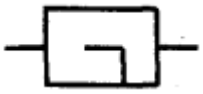
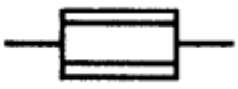
SYM No.	Description	Symbols	Remarks
0401	Gate Valve		
0402	Globe Valve		
0403	Check Valve		
0404	Angle Valve		
0405	Diaphragm Valve		
0406	Safety Valve (Pressure Relief Valve)		
0407	Ball Valve		
0408	Solenoid Valve		
0409	Float Valve		
0410	Butterfly Valve		
0411	Regulating Globe Valve		
0412	Foot Valve with Strainer		
0413	Plug Valve		

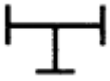
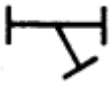
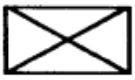
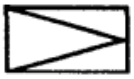
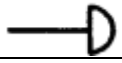
0414	Control Valve		
0415	Piston Operated Hydraulic Control Valve		
0416	Electrically Operated Control Valve		
0417	Pinch Valve		
0418	Spring Loaded Valve		
0419	Control Valve with Hand Wheel		
0420	PCV Down Stream		
0421	PCV UP Stream		
0422	Hand – Operated Valve		
0423	Plunger – Operated Valve		
0424	Pilot – Operated Valve		
0425	4 – Way Valve		
0426	Needle Valve		
0427	Positive Choke		
0428	Adjustable Choke		

0429	Motor Operated Valve		

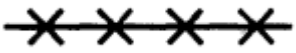
SECTION 5 FITTINGS

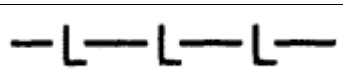
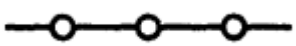
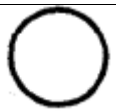
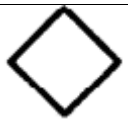
SYM No.	Description	Symbols	Remarks
0501	Expansion Joint		
0502	Hose Connector		
0503	Flexible Hose		
0504	Spectacle Blind		
0505	Line Blind		
0506	Reducer/Expander		
0507	Blind Flange		
0508	Drain Funnel		
0509	Threaded Cap		
0510	Orifice		
0511	Venturi Meter		
0512	Steam Trap		

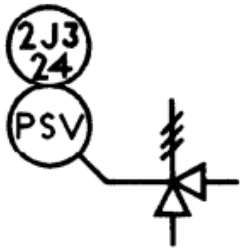
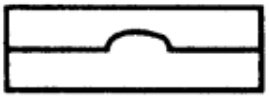
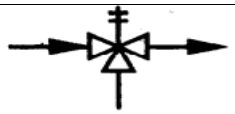
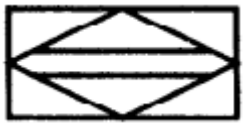
0513	Vent with Goose Neck		
0514	Sight Glass		
0515	Union		
0516	Coupling		
0517	Adaptor		
0518	Flow – Element		
0519	Turbine Meter		
0520	Pos. Disp. Meter		
0521	Rotameter		
0522	Sonic Meter		
0523	Magnetic Meter		
0524	Pitot Tube		
0525	Drain Plugged		
0526	Drain Flanged		
0527	Straightening Vanes		

0528	Analyser		
0529	Filter		
0530	Filter		
0531	T – Type strainer		
0532	Y – Type Strainer		
0533	Temporary		
0534	Basket Strainer		
0535	Flame Arrester		
0536	Cone Type Strainer		
0537	Sample Point		
0538	Pipe Cap Welded		

SECTION 6 INSTRUMENTATION SYMBOL

SYM No.	Description	Symbols	Remarks
0601	Instrument Air Signal		
0602	Instrument Electric Signal		
0603	Instrument Supply Lines		
0604	Instrument Capillary Tubing		

0605	Hydraulic Lines		
0606	Software Connections		
0607	Locally Mounted Instruments		
0608	Instruments Mounted on Main Panel		
0609	Instrument Mounted on Local Panel		
0610	Transmitter Locally Mounted		
0611	Transmitter Panel Mounted		
0612	Computer		
0613	Computer Local Panel		
0614	DCS / DIDC		
0615	Gas Filter		
0616	Interlock		
0617	Rear Panel Instrument		
0618	Running Light (Local)		

0619	Running Light (Panel)		
0620	Running Light (Local Panel)		
0621	Remote Telemetric Unit		
0622	Inlet Size		
0623	Rupture Disk		
0624	Rotameter		
0625	Diaphragm Seal		
0626	Breather Valve		
0627	Programmable Logic Control		
0628	Programmable Logic Control on Local panel		

Section 06 Instrument Legend (Refer Table 1 for definition of identification letters)	
P	Pressure Instruments
T	Temperature Instruments
L	Level Instruments
IL	Interface Level Instruments
F	Flow Instruments
A	Analyser Instruments

PCV	Self-Actuated Pressure Control Valve
TW	Thermowell
TE	Temperature Element
PB	Push Button
SOV	Solenoid Operated Valve
TJI	Multipoint Indicator
DPG	Differential Pressure Gauge
DIC	Differential Indicating Controller
DRC	Differential Recording Controller
I	Indicator
R	Recorder
IC	Indicating Controller
RC	Recording Controller
Y	Function (Modifier)
Q	Integrator (Summator)
AL	Alarm Low
AH	Alarm High
ALL	Alarm Low Low
AHH	Alarm High High
SL	Switch Low
SH	Switch High
SLL	Switch Low Low
SHH	Switch High High
PI	Pressure Indicator
TI	Temperature Indicator
LI	Level Indicator
ILG	Interface Level Gauge
FE	Flow Element
AE	Analyser Element
PT	Pressure Transmitter
LT	Level Transmitter
FT	Flow Transmitter
AT	Analyser Transmitter
ILT	Interface Level Transmitter
PV	Pressure Control Valve
TV	Temperature Control Valve
LV	Level Control Valve
ILV	Interface Level Control Valve
FV	Flow Control Valve
AV	Gas Actuated Valve
I/P	Current to Pneumatic Transducer
P/I	Pneumatic to Current Transducer
I/E	Current to Volts Transducer
E/I	Volts to Current Transducer
E/P	Volts to Pneumatic Transducer
P/E	Pneumatic to Volts Transducer
SDV	Shut Down Valve
MOV	Motor Operated Valve
XL	Running Light

XI	Running Indications
TT	Temperature Transmitter
SC	Sample Cooler
UC	Utility Connection
FG	Flow Class
PSV	Pressure Safety Valve
TSV	Thermal Safety Valve
RD	Rupture Disk
HIC	Hand Indicating Controller
HCV	Hand Control Valve
SS	Selection Switch
FO	Control Valve Fail Open
FC	Control Valve Fail Close
FL	Control Valve Fall Lock
TSO	Tight Shut Off
PVRV	Breather Valve (Pressure Vacuum Relief Valve)
AF	Flame Arrestor
EX	Excess Flow Check Valve
RTU	Remote Terminal Unit
IJ	Insulation Joint
LSS	Low Signal Selector
MSS	Manual Signal Selector
LO	Lock Open
LC	Lock Close
ZSH	Position Switch High (Valve Open)
ZHH	Position High High (Valve Open)
ZAH	Position Alarm High (Valve Open)
ZSL	Position switch Low (Valve Close)
ZLL	Position Low Low (Full Closed Valve)
ZAL	Position Alarm Low (Valve Closed)
FB	Full Bore
NB	Normal Bore
AS	Automatic Sampler
DPT	Differential Pressure Transmitter
FO	Restriction Orifice
C	Controller
UV	ON-OF Valve

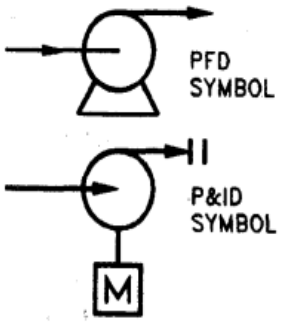
Table 1 Identification Letters

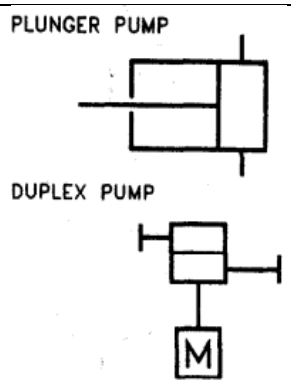
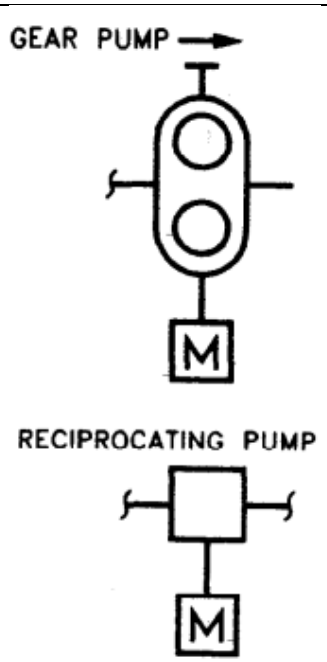
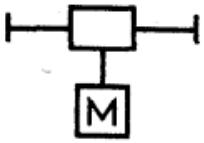
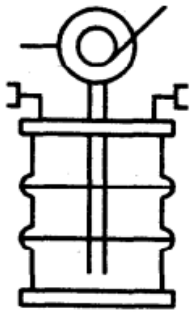
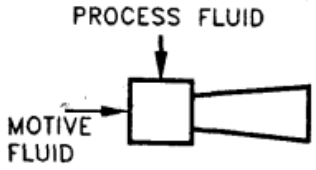
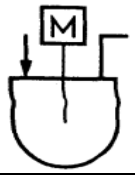
(*Clause* 2.2)

	First Letter		**Succeeding Letter**		
	Measured or Initiating Variables	Modifier	Read out or Passive Function	Output Function	Modifier
A	Analysis		Alarm		
B	Burner, Combustion		User's Choice	User's Choice	User's Choice
C	User's Choice			Control	
D	User's Choice	Differential			

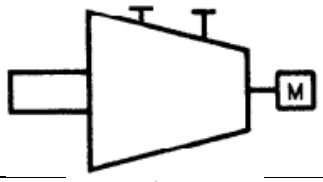
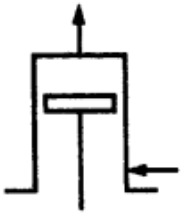
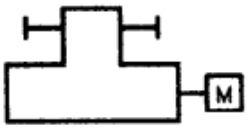
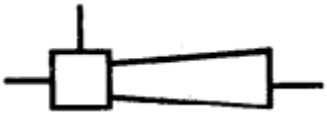
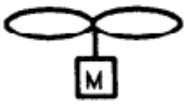
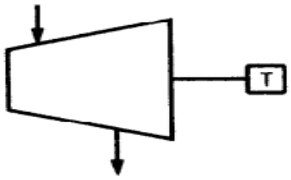
E	Voltage		Sesnor (Primary Element)		
F	Flow Rate	Ratio (Fraction)			
G	User's Choice		Glass, Viewing Device		
H	Hand				High
I	Current (Electrical)		Indicate		
J	Power	Scan			
K	Time, Time Schedule	Time Rate Change		Control Station	
L	Level		Light		Low
M	User's Choice	Momentary			Middle Intermediate
N	User's Choice		User's Choice	User's Choice	User's Choice
O	User's Choice		Office, Restriction		
P	Pressure, Vacuum		Point (Test) Connection		
Q	Quantity	Integrate, Totalise			
R	Radiation		Record		
S	Speed, Frequency	Safety		Switch	
T	Temperature			Transmit	
U	Multivariable		Multifunction	Multifunction	Multifunction
V	Vibration Mechanical Analysis			Valve, Damper, Louver	
W	Weight, Force		Well		
X	Unclassified	X Axis	Unclassified	Unclassified	Unclassified
Y	Event, State or Pressure	Y Axis		Relay, Compute, Convert	
Z	Position, Dimension	Z Axis		Driver, Actuator Unclassified Final Control Element	

SECTION 07 PUMPS

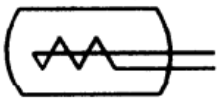
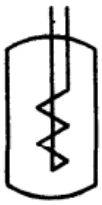
SYM No.	Description	Symbols	Remarks
0701	Centrifugal Pumps		

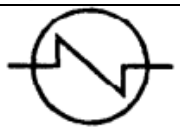
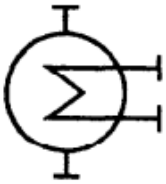
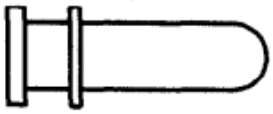
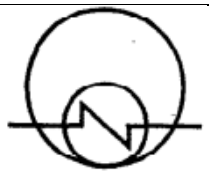
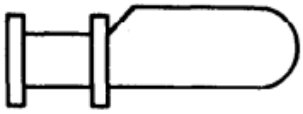
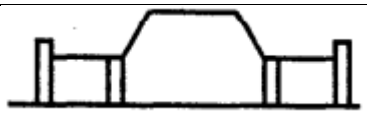
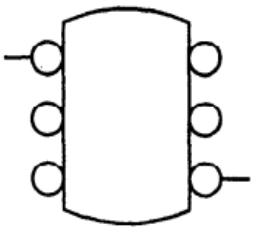
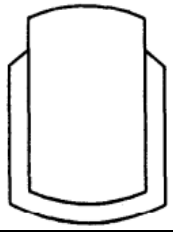
0702	Positive Displacement Pump		
0703	Proportioning Pump		
0704	Hand Pump with Drum		
0705	Ejector (Vapour Service)		
0706	Blowing Egg		

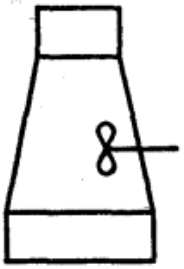
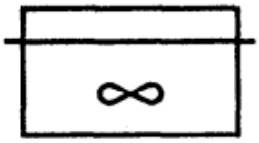
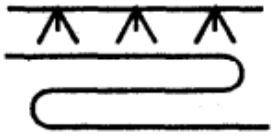
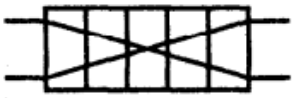
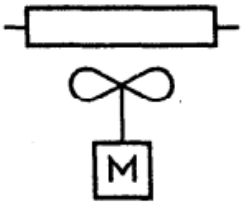
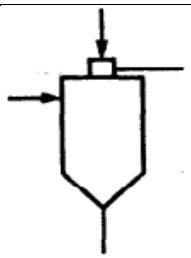
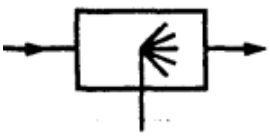
SECTION 8 COMPRESSORS

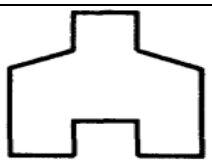
SYM No.	Description	Symbols	Remarks
0801	Centrifugal Compressor		
0802	Positive Displacement Compressor		
0803	Reciprocating Compressor		
0804	Ejector Compressor		
0805	Fan		
0806	Turbine		

SECTION 09 HEATING OR COOLING ARRANGEMENTS

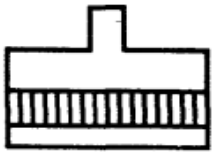
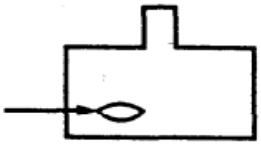
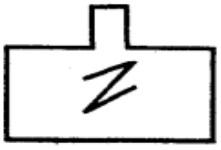
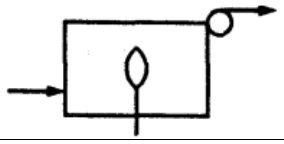
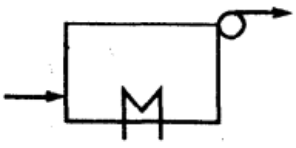
SYM No.	Description	Symbols	Remarks
0901	Immersion Coil	 	EXAMPLES–  

0902	Exchanger (In PFD)		
0903	Heat Exchanger		
0904	Exchanger		
0905	Exchanger		
0906	Kettle Reboiler		
0907	Kettle Reboiler		
0908	Kettle Reboiler 2 – Bundle		
0909	Tubular Coil		EXAMPLE :- 
0910	Jacket		EXAMPLE :- 

0911	Natural Draught Cooling Tower		
0912	Induced Draught Cooling Tower		
0913	Air Blown Cooler		Used for PFD
0914	Trickle Cooler		
0915	Plate Type Heat Exchanger		
0916	Air Cooler with Fan and Motor		
0917	Contact Condenser		
0918	Desuper Heater		

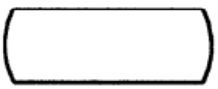
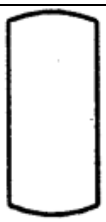
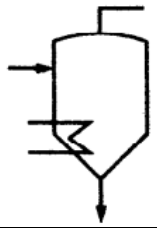
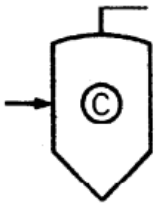
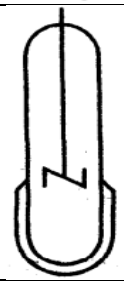
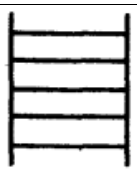
0919	One Cell Fired Heater / Furnace		
0920	Two Cell Fired Heater / Furnace		

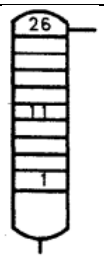
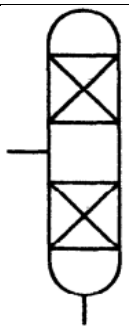
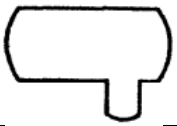
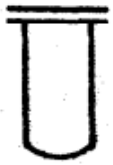
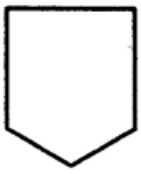
Section 10 Furnaces and Boilers

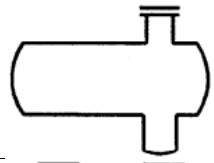
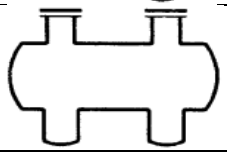
SYM No.	Description	Symbols	Remarks
1001	Solid Fuel Furnace		
1002	Oil, Gas or Pulverized Fuel Furnace		
1003	Electric Furnace		
SYM No.	**Description**	**Symbols**	**Remarks**
1004	Fired Boiler		
1005	Waste Heat Boiler		

SECTION 11 PROCESS VESSELS

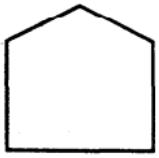
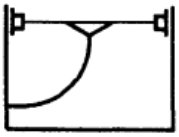
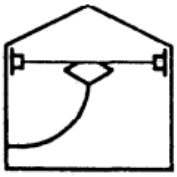
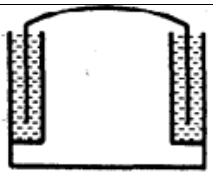
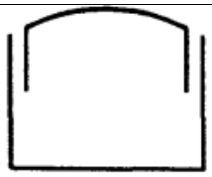
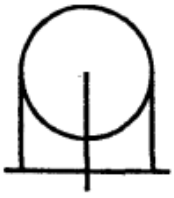
SYM No.	Description	Symbols	Remarks

1101	Horizontal Vessel		
1102	Vertical Vessel		
1103	Jacketed Vessel		
1104	Packed Vessel		
1105	Evaporator		
1106	Crystallizer		
1107	Autoclave		
1108	Construction Inside Containers, Columns Towers and Reactors		
1108A	Plates / Trays (For Mass Transfer)		

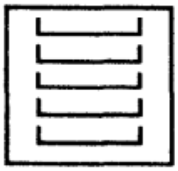
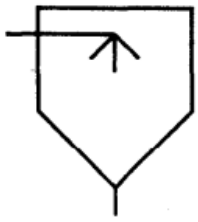
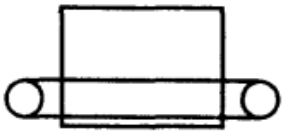
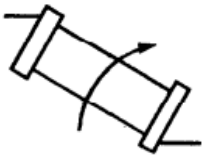
1108B	Fluidized BED		 Example :- Tray should be numbered from the bottom at least the first and last should be shown. Intermediate tray should be included & numbered where they are significant.
1109	Multi Bed Packed Column		
1110	Vessel with Boot		
1111	Deaerator		
1112	Flanged Vessel		
1113	Double Flanged Vessel		
1114	Conical Bottom Vessel		

1115	Vessel With One - Sump		
1116	Vessel with Two - Sumps		

Section 12 Storage Vessels / Tanks

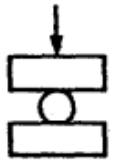
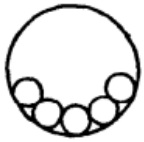
SYM No.	Description	Symbols	Remarks
1201	Fixed Roof Tank		
1202	Floating Roof Tank		
1203	Floating Cum Fixed Roof Tank		
1204	Gas Holder, Wet Seal		
1205	Gas Holder, Dry Seal		
1206	Pressure Storage (Sphere or Spheroid) Horton Sphere		

SECTION 13 DRYERS

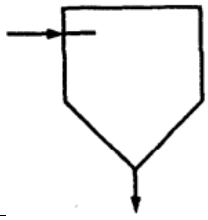
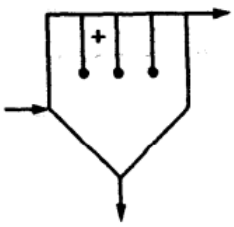
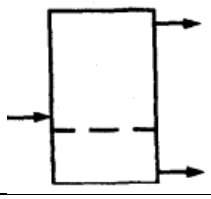
SYM No.	Description	Symbols	Remarks
1301	Batch Tray Drier		
1302	Spray Drier		
1303	Continuous Drier		
1304	Rotary Drier or Kiln		

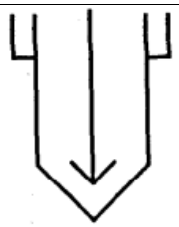
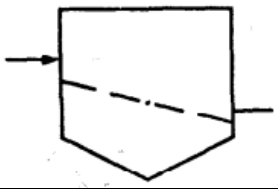
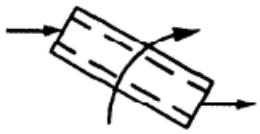
SECTION 14 SIZE REDUCTION EQUIPMENTS

SYM No.	Description	Symbols	Remarks
1401	Size Reducing Equipment (General Symbol)		Example: - Pulverizer
1402	Breaker, Gyratory		
1403	Breaker Hammer Mill Impact Mill		

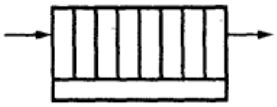
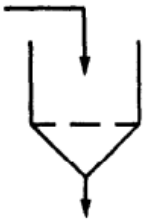
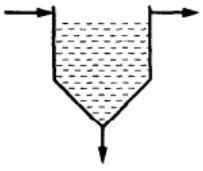
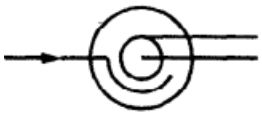
1404	Jaw Crusher		
1404A	Roller Crusher		
1405	Grinder		
1406	Ball or Tube Mill		

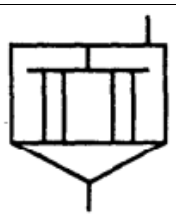
SECTION 15 SEPARATORS

SYM No.	Description	Symbols	Remarks
1501	Cyclone or Hydrocyclone		
1502	Electrostatic Separator (Electrical Purification of Gas)		
1503	Seperators for Liquids, Decantors		

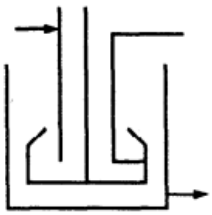
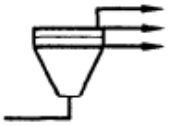
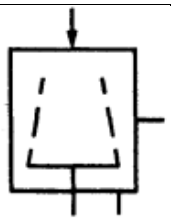
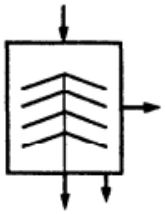
1504	Thickener		
1505	Screen	SCREEN, VIBRATORY 	SCREEN, ROTARY 

SECTION 16 FILTERS

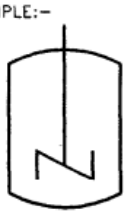
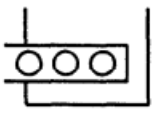
SYM No.	Description	Symbols	Remarks
1601	Filter Press		
1602	Suction Filter		
1603	Pressure Filter		
1604	Gravity Filter (Open Settling Tank)		
1605	Open Rotary Vacuum Filter		
1606	Closed Rotary Vacuum Filter		

1607	Bag Filter		BASKET FILTER 

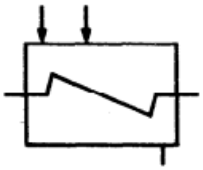
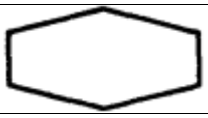
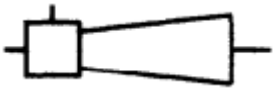
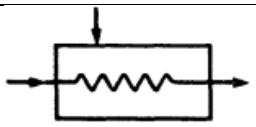
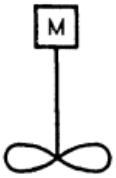
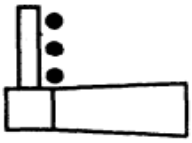
SECTION 17 CENTRIFUGES

SYM No.	Description	Symbols	Remarks
1701	Centrifuges (General Symbol)		ALTERNATIVE 
1702	Basket Centrifuge Batch or Continous		
1703	Plate Centrifuge		

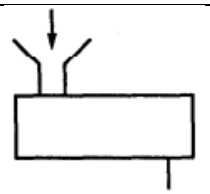
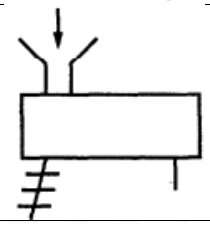
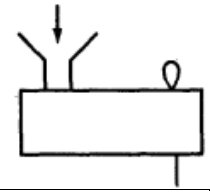
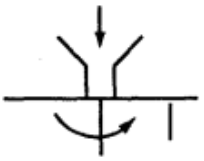
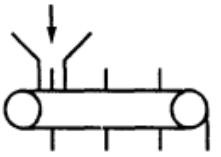
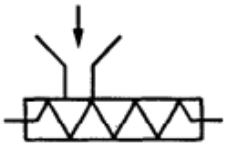
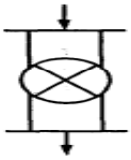
SECTION 18 STIRRERS

1801	General Symbol		EXAMPLE:- 
1802	Sparger		EXAMPLE:- 

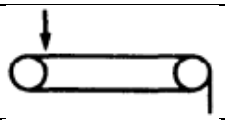
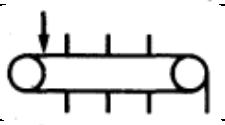
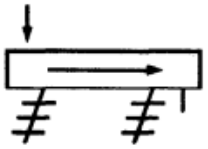
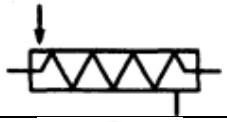
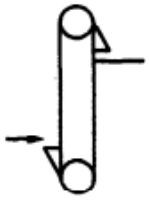
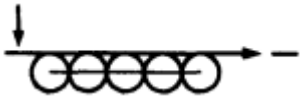
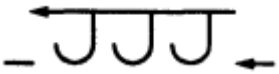
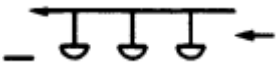
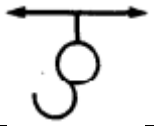
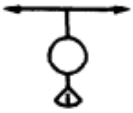
SECTION 19 MIXERS

SYM No.	Description	Symbols	Remarks
1901	Ribbon Blender		
1902	Kneader		
1903	Double Cone Blender		
1904	Ejector Mixer		
1905	Rotary Mixer		
1906	ON – Line Mixer		
1907	Mixer		
1908	Sacony Mixer		

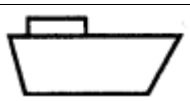
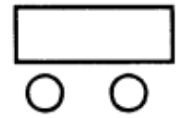
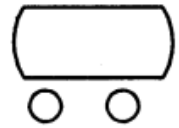
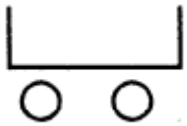
SECTION 20 FEEDERS

SYM No.	Description	Symbols	Remarks
2001	General Symbol		
2002	Vibrator Feeder		
2003	Weigh Feeder		
2004	Rotary Table Feeder, Revolving Plate Feeder		
2005	Scraper Feeder		
2006	Screw Feeder		
2007	Rotary Feeder		

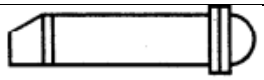
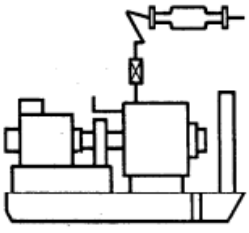
SECTION 21 CONVEYORS

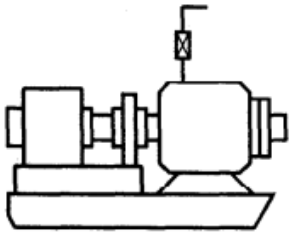
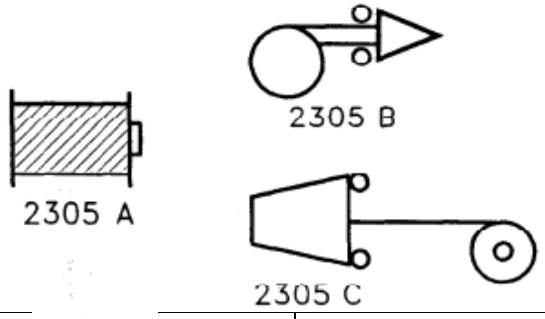
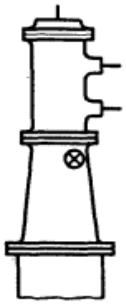
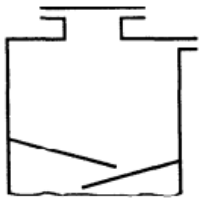
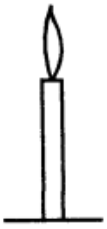
SYM No.	Description	Symbols	Remarks
2101	Belt Conveyor		
2102	Scraper Conveyor		
2103	Vibrating Conveyor		
2104	Screw Conveyor		
2105	Bucket Conveyor		
2106	Roller Conveyor		
2107	Overhead Conveyor with Hooks		
2107B	Overhead Conveyor or Ropeway with Buckets or Carriers		
2108A	Fixed Hoist With Hook		
2108B	Travelling Hoist with Hook		
2108C	Travelling Hoist with Grab		
2108D	Air Floats		

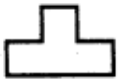
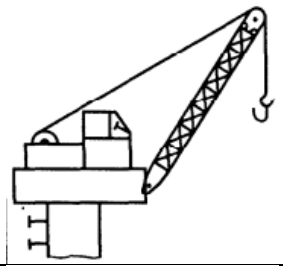
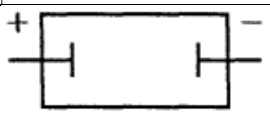
SECTION 22 TRANSPORT VEHICLES

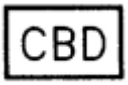
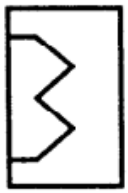
SYM No.	Description	Symbols	Remarks
2201	Ship		
2202	Wagon, Lorry, Truck		
2203	Tanker		
2204	Open Trailer		
2205	Wagon with Bottom Hopper		

SECTION 23 MISCELLANEOUS

SYM No.	Description	Symbols	Remarks
2301	Silencer		
2302	Launcher Receiver		
2303	Diesel Generator		

2304	Turbine Generator		
2305	Hose Reel		
2306A	Well Head with one Bore (Single Completion)		
2306B	Well Head with Two Bore (Dual Completion)		
2307	Sump Caisson		
2308	Flare		

2308B	Flare Stack		
2309	Chimney		
2310	Scrapper Tee		
2311	Atmospheric Vent		
2312	Cylinder		
2313	Graduated Cylinder		
2314	Crane		
2315A	Electrolytic Cell without Diaphragm		
2315B	Electrolytic Cell with Diaphragm		

2316	Turbine Drive		
2317	Motor Drive		
2318	Swivel Drain		
2319	CBD – Symbol		
2320	Sample Cooler		

SECTION 24 SERVICE FLUID CODES

P	Process
WCS	Cooling Water Supply
WCR	Cooling Water Return
WD	Drinking Water
WS	Service Water
WF	Fire Water
WR	Raw Water
WP	Process Water
WT	Treated Water
AI	Instrument Air
AP	Plant Air
AB	Breathing Air
BD	Blow Down
FL	Flare
FO	Fuel Oil
FG	Fuel Gas
GI	Instrument Gas
IG	Inert Gas
OWS	Only Water Sewer
SS	Strom Sever
CBD	Closed Blow Down
D	Drain
UC	Utility Connection
HM	Heating Medium
HMS	Heating Medium Supply

HMR	Heating Medium Return
EG	50% EG Solution
CHWS	Chilled Water Supply
CHWR	Chilled Water Return
WDM	Demineralised Water
SH	SP Steam
SM	MP Steam
SL	LP Steam
CH	Condensate HP
CM	Condensate MP
CL	Condensate LP
N	Nitrogen
BR	Brine
CS	Caustic Sewer
NA	Caustic
RE	Refrigerant Ethane
RA	Refrigerant Amonia
RP	Refrigerant Propane
AC	Acid Lines

SECTION 25 INSULATION/TRACING TYPE

IH	Hot Insulation
IC	*Cold Insulation*
IS	Safety Insulation
IT	Steam Traced
IE	Electric Traced
IA	Accoustic Insulation
IF	Thermal Fluid Tracing