

Sr.#	Description / Specifications/ Oat/ Pat no of Scientific/ Technical/ Administrative Store.	Qty. Required	Unit
1	2	3	4
	Supply of Japanese / European make valves having pressure rating of PN-16 or Class 150, Bronze body and screw type valves upto 2" dia (Brass body valves will not be accepted) and Cast iron body and flanged type valves above 2" dia complete with flanges, gasket, nuts and bolts as per specifications attached in following sizes and quantities: <u>Make:</u> As per approved manufacturer/make list attached. <u>Note:</u> Supplier must be directed to provide technical literature/submittals of quoted items alongwith quotation.		
1	Ball Valves		
	i) 3/4" dia	304	Nos
	ii) 1" dia	30	Nos
2	Gate Valves		
	i) 3/4" dia.	400	Nos
	ii) 1 " dia.	75	Nos
	iii) 1.25 " dia.	22	Nos
	iv) 1.5 " dia.	20	Nos
	v) 2 " dia.	14	Nos
	vi) 2.5 " dia.	18	Nos
	vii) 3 " dia.	6	Nos
2	viii) 4 " dia.	6	Nos
	ix) 5" dia.	16	Nos
	x) 6" dia.	4	Nos
	xi) 8" dia.	3	Nos
3	Motorized Butterfly Valves with electric actuator		
	i) 1" dia	4	Nos
	ii) 1.25" dia	5	Nos
	iii) 1.5" dia	8	Nos
	iv) 2" dia	6	Nos
	v) 2.5" dia	8	Nos
	vi) 5" dia	5	Nos
	vii) 6" dia	24	Nos
	viii) 8" dia	3	Nos
4	Regulating Valves (Globe Valves)		
	i) 3/4" dia.	200	Nos
	ii) 1 " dia.	40	Nos
	iii) 1.25 " dia.	12	Nos
	iv) 1.5 " dia.	18	Nos
	v) 2 " dia.	10	Nos
	vi) 2.5 " dia.	10	Nos
	vii) 3 " dia.	6	Nos

1	2	3	4
4	viii) 4" dia.	6	Nos
	ix) 5" dia.	6	
	x) 6" dia.	13	Nos
	xi) 8" dia.	4	Nos
5	Check Valves		
	i) 2.5" dia.	7	Nos
	ii) 5" dia.	4	Nos
	iii) 6" dia.	12	Nos
6	Y-Type Strainers		
	i) 3/4" dia.	200	Nos
	ii) 1 " dia.	40	Nos
	iii) 1.25 " dia.	12	Nos
	iv) 1.5 " dia.	10	Nos
	v) 2 " dia.	8	Nos
	vi) 2.5 " dia.	8	Nos
	vii) 3 " dia.	4	Nos
	viii) 5" dia.	5	Nos
	ix) 6" dia.	9	Nos
	x) 8" dia.	4	Nos
7	Air Vents (3/4" dia)	30	Nos
8	Chilled water flow meters (Digital type, flanged ends) with electromagnetic flow sensor.		
	i) 2.5" dia	2	Nos
	ii) 6" dia	4	Nos

9	Flexible Connectors		
	i) 3/4" dia.	400	Nos
	ii) 1 " dia.	80	Nos
	iii) 1.25 " dia.	24	Nos
	iv) 1.5 " dia.	20	Nos
	v) 2 " dia.	14	Nos
	vi) 2.5 " dia.	14	Nos
	vii) 5" dia.	4	Nos
	viii) 6" dia.	14	Nos
10	Pressure Gauges with 0.5" dia socket and thermo-siphon	75	Nos
11	Temperature Gauges	85	Nos
12	Counter Flanges for valves having welded neck (compatible with valves) including nuts, bolts and washers.		
	i) 2.5 " dia.	140	Nos
	ii) 3 " dia.	80	Nos
	iii) 4" dia.	36	Nos
	iv) 5" dia.	120	Nos
	v) 6" dia.	300	Nos
	vi) 8" dia.	40	Nos

13	Rubber Expansion Joints for pipe		
	i) 4" dia	6	Nos
	ii) 5" dia	6	Nos
	iii) 6" dia	6	Nos
	iv) 8" dia	6	Nos

## CHILLED WATER VALVES & ACCESSORIES

### 1. *Gate Vales:*

- a. 2.5 inch (65 mm) and larger: Cast Iron/ bronze body (Not Brass), renewable composition disc, flanged PN 16/ Class 150.
- b. 2.0 inch (50 mm) and smaller: Bronze body (Not Brass), renewable composition disc, threaded, PN 16/ Class 150.

**Make:** As per approved make list attached.

### 2. *Globe/Regulating Valves:*

- a. 2.5 inch (65 mm) and larger: Cast Iron, flanged, PN 16/ Class 150
- b. 2.0 inch (50 mm) and smaller: Bronze body (Not Brass), threaded, PN 16/ Class 150.

**Make:** As per approved make list attached.

### 3. *Motorized Butterfly Valves With Electric Actuator:*

- a) Valves will be used for chilled water application in HVAC system for on/off & modulating control and class rating of valves shall be PN-16/Class 150.
- b) Valves shall be one piece / uni body construction of cast iron designed to accommodate ANSI 150 flanges.
- c) Valves bodies shall be bi-directional tested in both directions and be bubble tight with zero leakage.
- d) Valves shall be with extended neck design for ample application of insulation.
- e) Iron body, one piece alloy steel shaft, bronze disc or iron disc with stainless steel stem, resilient elastomer replaceable seat with integral reinforcing ring or keyed to body and EPDM/NBR liner material.
- f) Valves shall be provided with visual mechanical position indicator for accurate visual reference of valve position.
- g) Valve Travel angle shall be  $90^{\circ} \pm 5^{\circ}$
- h) Electric actuator shall be epoxy coated aluminum.
- i) Electric actuator (24V AC/DC) and required torque shall be selected according to the size of valve. Actuator shall be provided with position feedback mechanism (open/close).

**Note: (Lever or gear operated valves are not acceptable).**

**Make:** As per approved make list attached.

**Actuator Make:** As per approved make list attached.

4. **Check Valves:**

- a. 2.5 inch (65 mm) and larger: Cast Iron, non – shock, bronze trim swing check, renewable disc and seat, bolted cover, flanged, PN 16/ Class 150.
- b. 2.0 inch (50 mm) and smaller: Bronze body, swing check, screwed cover, threaded, PN 16/ Class 150.

**Make:** As per approved make list attached.

5. **3-way Modulating valves**

3-way valves of Cast Iron body with electric actuators, Controllers and duct sensors, 24 VAC, Bronze rising stem , renewable composition disc, flanged type (For 65mm and larger diameter), Threaded ends (For 50mm and smaller diameter).

**Make:** As per approved make list attached.

6. **Flexible Connector/ Expansion joints:**

Flanged ends (For 65 mm and larger diameter) having pressure rating of PN-16/ Class 150.

Threaded ends (For 50mm and smaller diameter) reinforced neoprene rubber, PN-16/Class 150.

Flexible connectors shall be constructed of rubber, tetra fluoro-ethylene resin, or corrosion resisting steel, bronze, monel or galvanized steel. The material used and the configuration shall be suitable for pressure, vacuum, temperature and circulation medium. The flexible section may be reinforced with metal retaining rings, with built-in reinforcement and restriction bolts or with wire braid cover suitable for the service intended

**Make:** As per approved make list attached.

7. **Strainers:**

“Y” pattern strainers, PN 16/ Class 150, with screens of type 304 stainless steel, provided with a valve blow- off connection. Maximum pressure drop with screen shall not exceed 1 psi (6.89 kpa) with velocity through inlet pipe of 5 ft/sec (1.5 m/s).

- a. 2.5 inch (65 mm) and larger: Cast Iron, flanged, PN 16/ Class 150.
- b. 2.0 inch (50 mm) and smaller: Cast Iron, threaded, PN 16/ Class 150.

**Make:** As per approved make list attached.

8. ***Glass Tube Thermometer:***

Pipe Line Thermometer shall be complete with dust-tight metal case, 9 inch scale length, red reading mercury tube and white scale black lettering. Temperature range shall be 0 to 100 deg F for chilled water with temperature marking in 1 deg F increments.

**Make:** As per approved make list attached.

9. ***Pressure Gauges***

Shall be dust tight 4 inch diameter metal case, white dial with black marking, dial range to cover twice the average working pressure ranging between 0 to 10 Bar of the equipment, clear lens, phosphor bronze bourdon tube, silver soldered, brass movement, bronze or nylon bushed, scale and movement mounted independent of the case and brass socket (1/2" dia) with thermo siphon.

**Make:** As per approved make list attached.

10. ***Automatic Air Vents***

Automatic air vents shall be float actuated high capacity air vent designed to purge free air from the system and provide shutoff at pressure up 150 psig at a maximum temperature of 120 Deg C. The design of the capacity air vent shall prevent air from entering the system if system pressure drops below atmospheric pressure.

**Make:** As per approved make list attached.

11. ***Digital Type Water Flow Meter:***

- a) Flow meter should be a complete package including digital electromagnetic flow sensor, transmitter designed to meet chilled water application and having flanged connections (EN 1092-1 for PN-16 or ANSI B16.5 for class 150) suitable for installation in Sch-40 ASTM A-106 Grade B pipe lines of diameter mentioned in Annexure-B.
- b) Flow meter should work on the principle of electromagnetic induction.
- c) Ambient temperature range = -10 deg C to 50 deg C,  
Maximum operating Pressure= 20 Bar  
Enclosure Rating= IP67.
- d) Flow meter body and flange material must be Carbon Steel A-105/A106 or Cast iron material with corrosion resistant two component epoxy coatings.
- e) NBR hard rubber and Ebonite hard rubber liner or EPDM liner for water application.

**Make:** As per approved make list attached.

12. ***Flanges and Flange Accessories:***

- a) Welding flanges for 2.5 inch (65 mm) and larger shall be forged steel ASTM A181, class 150, ANSI B16.5 or approved equivalent for ASTM A-106 grade-B SCH-40 pipe material.

b) Bolts, square head machine with hexagonal nut, Galvanized steel ASTM A307, ANSI 818

Note:- All threaded valves below 2.5 inch diameter must be of Bronze body (Brass body valves will not be accepted. Except where special features are required or otherwise specified, all globe, gate, strainers and check valves shall be of same brand/manufacturer.

13.

### **VALVES & ACCESSORIES APPROVED MAKE LIST**

Pipe line Dial Thermometer	WEKSELER, ASHCROFT, WEISS, MOELLER, TRERICE OR APPROVED EQUAL
Flexible Connectors	TOZEN, MARAFLEX OR APPROVED EQUAL
Air Vents	SPIRAX-SARCO, PENN OR APPROVED EQUAL
Balancing Valves	OVENTROP, ECONOSTO, BELL & GOSSET, KITZ OR APPROVED EQUIVALENT
Gate Valves, Globe/Regulating Valves, Strainers, and Check Valves	
Ball Valves	
Pressure Gauge	TRERICE, WEKSLER, WEISS, DWYER, ASHCRAFT, MOELLER OR APPROVED EQUAL
Flow Switch	HONEYWELL, JOHNSON, SIEB, SCHNIEDER OR APPROVED EQUAL
2 Way / 3 Way Modulating Valves	HONEWELL, BARBER-COLMAN, JOHNSON, SATCHWELL, KITZ, SCHNIEDER OR APPROVED EQUAL
Damper/valve Actuator	HONEYWELL, JOHNSON, SIEBE, INVENSYS & TEMET OR APPROVED EQUAL