### FIRE FIGHTING EQUIPMENT DATA SHEET

**DELUGE VALVE**

**DATA SHEET**

**JOB NO. :**

**RFQ. NO. :**

**ISSUE : SHEET OF**

#### CUSTOMER : ITEM NO. :

#### PROJECT : QUANTITY :

#### LOCATION : SERVICE : FIRE WATER AND / OR FOAM SYSTEM

#### CODE & STANDARDS

<table>
<thead>
<tr>
<th>APPROVALS</th>
<th>CODE &amp; STANDARDS</th>
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</thead>
<tbody>
<tr>
<td>□ UL LISTED</td>
<td>□ NFPA</td>
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<tr>
<td>□ FM APPROVED</td>
<td>□ BS</td>
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<td>□ KFEIC</td>
<td>□ KFPL</td>
</tr>
<tr>
<td>□ OTHERS</td>
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</table>

#### OPERATING CONDITIONS

<table>
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<tr>
<th>TEMPERATURE</th>
<th>MIN. : ( ) °C</th>
<th>OPER. : ( AMB ) °C</th>
<th>DESIGN : ( ) °C</th>
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<tbody>
<tr>
<td>PRESSURE</td>
<td>OPER. : ( 15 ) kg/cm²</td>
<td>DESIGN : ( 20 ) kg/cm²</td>
<td>HYDRO TEST : ( 25 ) kg/cm²</td>
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</tbody>
</table>

#### FLUID HANDLED

| WATER AND / OR | SEA WATER | FOAM-WATER SOLUTION |

#### INSTALLATION

| OUTDOOR AND / OR | INDOOR |

#### DESIGN FEATURES

<table>
<thead>
<tr>
<th>TYPE</th>
<th>(1) BODY</th>
<th>ANGLE</th>
<th>STRAIGHT</th>
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</thead>
<tbody>
<tr>
<td>(2) RELEASE</td>
<td>□ PNEUMATIC</td>
<td>□ HYDRAULIC</td>
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</tr>
</tbody>
</table>

#### SIZE

| □ 8" | □ 6" | □ 4" | □ 3" | □ 2" |

#### CONNECTION

| ANSI 150LBS RF | KS 10kg/cm² FF | KS 16kg/cm² FF |

#### MATERIALS

| VALVE BODY | CAST IRON | DUCTILE IRON | CAST STEEL |
| CLAPPER | BRONZE | BRASS |
| SEAT RUBBER | BRONZE | BRASS |

#### ACCESSORIES

<table>
<thead>
<tr>
<th>TRIM</th>
<th>BASIC TRIM</th>
<th>DRY PILOT TRIM(PNEUMATIC RELEASE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WET PILOT TRIM(HYDRAULIC RELEASE)</td>
<td>ELECTRIC RELEASE TRIM</td>
<td></td>
</tr>
<tr>
<td>TEST AND ALARM TRIM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### ALARM

| WATER MOTOR GONG | ELECTRIC SIREN |

#### OTHERS

| COMPANION FLANGE | GASKET | BOLT & NUT |

#### TEST & INSPECTION

| DIMENSION INSPECTION | REVIEW MATERIAL INSPECTION | WITNESS | REVIEW |
| VISUAL INSPECTION | REVIEW PERFORMANCE TEST | YES | NO |

#### NET WEIGHT WITHOUT TRIM

| 8" | 214kg | 6" | 136kg | 4" | 76kg |
| 3" | 52kg | 2" | 47kg |

#### PAINTING

| MANUFACTURER'S STANDARD |
| 8" - 214kg | 6" - 136kg | 4" - 76kg |
| 3" - 52kg | 2" - 47kg |

#### COLOR

| RED | 2006-11-25 |

| J. K. JEONG | Y. K. AN | S. M. LEE | FOR STANDARDIZATION |

**REV** | **DATE** | **PRP'D** | **CHK'D** | **APP'D** | **DESCRIPTION**
<table>
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<td>J. K. JEONG</td>
<td>Y. K. AN</td>
<td>S. M. LEE</td>
<td>FOR STANDARDIZATION</td>
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<td>4</td>
<td></td>
<td></td>
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</table>
TECHNICAL DATA:

MODEL: A

NOMINAL SIZE: 200, 150, 100, 80 & 50NB

MAXIMUM SERVICE PRESSURE: 12 Bar (175 psi)

THREADED OPENING: BSPT

MOUNTING: 90° pattern inlet to outlet vertical mounting.

FACTORY HYDROSTATIC TEST PRESSURE: 25 Kg./sq.cm. (350 psi)

FLANGE CONNECTION: ANSI B 16.1 FF #125

TRIM: Galvanized steel with brass valves

RECOMMENDED FLOW RATE:
- 200NB: 300 to 1150 m³/hr
- 150NB: 170 to 650 m³/hr
- 100NB: 50 to 225 m³/hr
- 80NB: 30 to 110 m³/hr
- 50NB: 10 to 55 m³/hr

FRICTIONAL LOSS IN TERMS OF EQUIVALENT LENGTH:
- 200NB: 26.00 metres
- 150NB: 19.00 metres
- 100NB: 11.00 metres
- 80NB: 5.50 metres
- 50NB: 1.80 metres

WET PILOT SPRINKLER HEIGHT LIMITATION: As per graph in the catalogue.

NET WEIGHT WITHOUT TRIM:
- 200NB: 214 Kg.
- 150NB: 136 Kg.
- 100NB: 76 Kg.
- 80NB: 52 Kg.
- 50NB: 47 Kg.

FINISH: Fire red PU painted.

APPROVAL: UL listed.

ORDERING INFORMATION: Size of valve, flange connection and trim details.

Deluge Valve is known as a system control valve in a deluge system, used for fast application of water in a spray system. Deluge valve protects areas such as power transformer installation, storage tank, conveyor protection and other industrial application etc. With the addition of foaming agent they do protect aircraft hanger and inflammable liquid fire.

VALVE OPERATION

Deluge valve is a quick release, hydraulically operated diaphragm valve. It has three chambers, isolated from each other by the diaphragm operated clapper and seat seal. While in ‘SET’ position, water pressure is transmitted through an external bypass check valve and restriction orifice from the system supply side to the top chamber, so that supply pressure in the top chamber acts across the diaphragm operated clapper which holds the seat against the inlet supply pressure because of differential pressure design. On detection of fire the top chamber is vented to atmosphere through the outlet port via opened actuation device(s). The top chamber pressure cannot be replenished through the restricted inlet port, thus it reaches less than half the supply pressure instantaneously and the upward force of the supply pressure lifts the clapper allowing water to enter the system piping network and alarm devices.

TRIM DESCRIPTION

a) BASIC TRIM

The basic trim is required on deluge valve regardless of the release system. It contains those components which are required in all types of installation, such as the main drain valve, priming connection, drip check valve, emergency release valve and pressure gauges.
b) DRY PILOT TRIM (PNEUMATIC RELEASE)
Dry pilot operation uses a pilot line of closed Sprinklers/ QB detectors containing air under pressure, located in the area to be protected. It requires regulated dry air supply with main supply point through restricted orifice. The pilot line is connected directly to the top of POSITIVE DRAIN ACTUATOR (PDA). The bottom of PDA is connected to the top chamber of the deluge valve.

When the air pressure drops, due to release of any of the release devices on detection of fire, the diaphragm of PDA is lifted and allows the water to drain. This reduces the water pressure in the top chamber of the deluge valve and when the pressure in the top chamber reaches 50% of the supply pressure, the deluge valve opens. The direct drain of PDA starts when the top chamber pressure of deluge valve reaches approximately 0.5 Kg/sq.cm. This positive drain will not permit the deluge valve to close unless the PDA is set manually. The recommended air supply pressure is as per TABLE-1.

<table>
<thead>
<tr>
<th>LINE WATER PRESSURE Kg./ Sq.cm. MAXIMUM</th>
<th>AIR PRESSURE IN DETECTION LINE Kg./ Sq.cm. MINIMUM</th>
<th>MAXIMUM</th>
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<tbody>
<tr>
<td>2</td>
<td>1.2</td>
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<tr>
<td>4</td>
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<td>3.5</td>
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<tr>
<td>12</td>
<td>3.5</td>
<td>4.0</td>
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</table>

c) WET PILOT TRIM (HYDRAULIC RELEASE)
Wet pilot operation uses a pilot line of closed sprinklers containing pressurised water, supplied through the upstream side of the deluge valve, through a restricted orifice. All the release lines are connected to a common release line. Due to release of any one of the release devices, the water pressure in the top chamber of the deluge valve reaches 50% of the supply pressure, the deluge valve opens.

CAUTION
While using a deluge valve in the wet pilot system the height and the length of the wet pilot detection line is to be limited as given in the wet pilot sprinkler height limitation graph.

d) ELECTRIC RELEASE TRIM
To actuate a deluge valve electrically, a solenoid valve is provided to drain the water from the top chamber of the deluge valve. A pressure switch is provided to activate an electric alarm, to shut down the desired equipment or to give “Tripped” indication to the panel. In addition to this two nos of pressure switches can be used to monitor “Low air pressure” and “Fire condition” when used in dry pilot air line.

e) TEST AND ALARM TRIM WITH SPRINKLER ALARM
This trim is supplied with the sprinkler alarm bell, which bells on actuation of the deluge valve. A test valve is provided to test the normal operation of the sprinkler alarm bell.

RESETTING PROCEDURE FOR THE DELUGE VALVE
(i) Close the upstream side stop valve provided below the deluge valve.
(ii) Open both the drain valves and close them when the flow of water has ceased.
(iii) Inspect and release if required, or close the section of the detection system subjected to “Fire condition”.

(iv) In case of dry pilot detection system, open the air supply valve to build-up air pressure as shown in TABLE-1. Open the priming valve fully and press hold the knob of PDA till the water pressure gauge indicate full service line pressure, then release the PDA knob. Open the upstream side of the stop valve provided below the deluge valve. No water should flow into the system, this can be checked by depressing the drip check valve knob.

CAUTION
(a) Do not close the priming valve, down stream and upstream stop valves, while the system is in service.
(b) The releasing device must be maintained in the open position, when actuated, to prevent the deluge valve from closure.

SYSTEM TESTING PROCEDURE
(i) Keep the upstream side of the stop valve partially open. Open the upstream side of the drain valve, to maintain a minimum pressure of 3 Kg./sq. cm on the upstream side of the deluge valve. To avoid water damage close the system side stop valve. This valve is to be kept in open position after the testing is completed.
(ii) Open the system side drain valve of the deluge valve.
(iii) Let any of the release devices to trip. This will result in a sudden drop of water pressure in the deluge valve top chamber resulting the deluge valve to open. The water flowing through the down stream side drain valve confirms that the deluge valve has actuated, immediately close the upstream side stop valve.
(iv) Periodic Check

Conduct the water flow test by actuating few of the release devices provided in the system. Clean all strainer(s) and priming line restriction. This test is to be carried out at least once in six months.

Abnormal Condition

(i) Alarm fails to sound

(a) Check for any obstruction in the alarm test line. Ensure that the sprinkler alarm is freely operating.

(b) If an electric alarm is provided, check the electrical circuitry to the alarm.

(ii) False Trips

(a) Check for clogging in priming line, restriction orifice check valve, priming valve & strainer.

(b) Leakage in the release system.

(c) The deluge air panel orifice clogged or low supply pressure.

(iii) Leakage through the Deluge Valve

(a) Damaged deluge valve seat or obstruction on the seat face by foreign object.

(b) Leakage in release system.

(c) Partly clogged priming line, restriction check valve.

(d) Low air pressure on release system line or leakage in release system.

(e) PDA seat leakage due to seat damage or obstruction on seat face by foreign objects (in dry pilot system only)

Note

UL listing is valid only when Deluge Valve is installed with trim set as per trim drawing.
DELUGE VALVE MODEL-A SIZE 200 / 150 / 100 / 80 / 50 NB

DIMENSION in millimeter (Approximate)

<table>
<thead>
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<th>VALVE NOMINAL SIZE</th>
<th>'A'</th>
<th>'B'</th>
<th>'C'</th>
<th>'D'</th>
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<td>330</td>
<td>455</td>
<td>540</td>
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<td>150 NB</td>
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<tr>
<td>100 NB</td>
<td>165</td>
<td>240</td>
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<td>370</td>
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<tr>
<td>80 NB</td>
<td>135</td>
<td>210</td>
<td>272</td>
<td>316</td>
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<td>50 NB</td>
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<td>210</td>
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<td>316</td>
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PART LIST

<table>
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<tr>
<th>ITEM</th>
<th>200 NB PART NO.</th>
<th>150 NB PART NO.</th>
<th>100 NB PART NO.</th>
<th>80 NB PART NO.</th>
<th>50 NB PART NO.</th>
<th>DESCRIPTION</th>
<th>QTY. 200 NB</th>
<th>QTY. 150 NB</th>
<th>QTY. 100 NB</th>
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<th>MATERIAL SPECIFICATION</th>
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NOTE: WHEN TEST & ALARM TRIM IS SUPPLIED THEN SL.NO. 28 (PLUG) IS NOT REQUIRED.
WHEN ELECTRIC TRIM IS SUPPLIED THEN SL.NO. 27 (PLUG) IS NOT REQUIRED.
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* Specification to be provided at time of ordering..

# Pressure switch as optional can be provided for "DV actuated" announcement, switch to be mounted at the outlet of deluge valve. In dry pilot trim additional pressure switch can be provided for low pressure alarm.

@ 2 way solenoid valve with 24VDC/110 VAC/220 VAC for remote actuation.
NOTE: WHEN TEST & ALARM TRIM IS SUPPLIED THEN SL.NO. 26 (PLUG) IS NOT REQUIRED.
WHEN ELECTRIC TRIM IS SUPPLIED THEN SL.NO. 25 (PLUG) IS NOT REQUIRED.
### WET PILOT BASIC TRIM, WITH TEST AND ALARM TRIM & ELECTRIC RELEASE TRIM MODEL-A

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* Specification to be provided at time of ordering.

# Pressure switch as optional can be provided for "DV actuated" announcement. Pressure switch to be mounted at the outlet of deluge valve.

@ 2 way solenoid valve with 24VDC/110 VAC/220 VAC for remote actuation
PNEUMATIC AND ELECTRIC RELEASE TRIM

HYDRAULIC AND ELECTRIC RELEASE TRIM

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INSTALLATION MEASUREMENT IN MM. (Approximate)

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<th>SIZE</th>
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<th>100NB</th>
<th>80NB</th>
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</tbody>
</table>
WET PILOT SPRINKLER
HEIGHT LIMITATION OF 200NB

WET PILOT SPRINKLER
HEIGHT LIMITATION OF 150NB

SYSTEM SUPPLY PRESSURE - PSI

MAXIMUM PLOT LINE HEIGHT - FEET

MAXIMUM PLOT LINE HEIGHT - METER

EQUIVALENT LENGTH BASED ON 1/4" SCHEDULE 40 PIPE WITH C = 120
WET PILOT SPRINKLER HEIGHT LIMITATION OF 50NB

Equation:

\[ \text{Maximum Pilot Line Height (feet)} = \frac{\text{System Supply Pressure (psi)}}{\sqrt{20 \times \text{KG/M}^2}} \]

Equations:

1. \[ \text{Maximum Pilot Line Height (feet)} = \frac{\text{System Supply Pressure (psi)}}{\sqrt{20 \times \text{KG/M}^2}} \]
2. \[ \text{Equivalent Length Based on } \frac{3}{8} \text{" Schedule 40 Pipe with } C = 120 \]
3. \[ \text{Equivalent Length Based on } \frac{3}{8} \text{" Schedule 40 Pipe with } C = 120 \]