

|                             |   |                |  |          |
|-----------------------------|---|----------------|--|----------|
| Item No. / Qty              | 1                                       | 1              | Ref. No.   |          |
| Tag No.                     | LCV-202                                 |                | Purchaser  |          |
| Service                     | LIQUID RETURN CONTROL VALVE             |                | End user   |          |
| <Control valve>             |   |                | <Remarks>  |          |
| Model                       | HTS                                     |                | SV0703-105 Indicating unit : "kgf/cm2"   |          |
| Description                 | Top-Guided Single Seated Control Valves |                | SV0020-310 Oil free treatment for stainless steel body and Water free treatment                        |          |
| Body/Port size              | 1-1/2 in.                               | 1-1/4 in.      | SV0006-002 Tag No. plate mounted on Diaphragm case (Plate size and description are Yamatake standard.) |          |
| Conn. Size. / Rated CV      |   | 17             | SV0801-E01 Material certificate in English. Scope: valve body and bonnet                               |          |
| Rating / Conn. Type         | ANSI300                                 | RF             | SV0201-003 Seat leakage: Less than 0.01%CV (Equivalent IEC, JIS Class IV)                              |          |
| Body material               | SCS13A                                  |                | Old Production No : R-29287-41-020-2   |          |
| Trim material               | SUS316 STELLITE                         |                | deliver WITHOUT Ship Class LR options (witness inspection,hydrostatic test,and certified material)     |          |
| Flow characteristic         | EQ%                                     |                |  |          |
| Bonnet                      | EXT-1 (-45 to -17 degC)                 |                |  |          |
| Actuator / Handle           | HA2R                                    | ---            |  |          |
| Action                      | AIR TO OPEN                             |                |  |          |
| Gland packing / Grease      | V-PTFE                                  | ---            |  |          |
| Gasket                      | V543(PTFE),V563(PTFE)                   |                |  |          |
| Air supply / Spring range   | 2.8kgf/cm2                              | 0.8-2.4kgf/cm2 |  |          |
| Seat leakage                | CLASS IV                                |                |  |          |
| Color: Body/Diaph./Yoke     | No-painting                             | M10B5/10       | M10B5/10   |          |
| Paint                       | Standard                                |                |  |          |
| <Accessories>               |   |                |  |          |
| Positioner                  | HTP-1D                                  |                |  |          |
| Structure                   |   |                |  |          |
| Input signal                | 0.2-1.0 kgf/cm2                         |                |  |          |
| Regulator                   | KZ03-2A-1N                              |                | 1  |          |
| Regulator2                  |   |                |  |          |
| Limit switch                |   |                |  |          |
| Action                      |   |                |  |          |
| Solenoid valve              |   |                |  |          |
| Action / Power              |   |                |  |          |
| Booster                     |   |                |  |          |
| Air lock valve              |   |                |  |          |
| <Process data>              |   |                |  |          |
| Fluid name/Phase            | BUTANE                                  |                | FLASH(FCI)   |          |
|                             | MAX                                     | NOR            | MIN  | Unit     |
| Flow rate                   | 4517                                    |                |  | kg/h     |
| Inlet pressure              | 4.7                                     |                |  | kgf/cm2A |
| Outlet pressure             | 1.25                                    |                |  | kgf/cm2A |
| Differential press.         | 3.45                                    |                |  | kgf/cm2  |
| Shut-off press.             | 19.1                                    |                |  | kgf/cm2  |
| Temperature                 | 40                                      |                |  | degC     |
| Density/Gravity(Liq)        | 0.555                                   |                |  | water=1  |
| Density/Gravity(G,V)        | 58.12                                   |                |  | MW       |
| Viscosity                   |   |                |  | mPa-s    |
| Flash                       | 22.6                                    |                |  | %        |
| Calculated CV               | 11.865                                  |                |  |          |
| Travel                      | 89                                      |                |  | %        |
| Inlet velocity              | 2.048                                   |                |  | m/s      |
| Predictive SPL              | 60                                      |                |  | dBA      |
| <Piping spec.>              |   |                |  |          |
| Strength Calc. Sheet        |   |                |  |          |
| Design                      |   |                | kgf/cm2G   |          |
| Temp.                       | -45 / 50                                |                | degC   |          |
| Size                        | 1-1/2 in.                               | 1-1/2 in.      |  |          |
| Sch No.                     | 40                                      | 40             |  |          |
| Thickness                   | 3.7                                     | 3.7            |  |          |
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|                             |                             |          |     |          |  |  |
|-----------------------------|-----------------------------|----------|-----|----------|--|--|
| Item No. / Qty              | 2                           |          | 1   |          | Ref. No.                               |  |
| Tag No.                     | LCV-301                     |          |     |          | Purchaser                              |  |
| Service                     | LIQUID SUPPLY CONTROL VALVE |          |     |          | End user                               |  |
| <Control valve>             |                             |          |     |          | <Remarks>                              |  |
|                             |                             |          |     |          |  |  |
| Description                 |                             |          |     |          | SV0703-105 Indicating unit : "kgf/cm2" |  |
| Body/Port size              |                             |          |     |          | 3/4 in. Cv=4.0                         |  |
| Conn. Size. / Rated CV      |                             |          |     |          | 4.0                                    |  |
| Rating / Conn. Type         |                             |          |     |          | ANSI300 RF                             |  |
| Body material               |                             |          |     |          | SCS13A                                 |  |
| Trim material               |                             |          |     |          | SUS316 STELLITE                        |  |
| Flow characteristic         |                             |          |     |          | EQ%                                    |  |
| Bonnet                      |                             |          |     |          | PLAIN (-17 to 230 degC)                |  |
| Actuator / Handle           |                             |          |     |          | HA2R ---                               |  |
| Action                      |                             |          |     |          | AIR TO OPEN                            |  |
| Gland packing / Grease      |                             |          |     |          | V-PTFE ---                             |  |
| Gasket                      |                             |          |     |          | V543(PTFE),V563(PTFE)                  |  |
| Air supply / Spring range   |                             |          |     |          | 2.8kgf/cm2 0.8-2.4kgf/cm2              |  |
| Seat leakage                |                             |          |     |          | CLASS IV                               |  |
| Color: Body/Diaph./Yoke     |                             |          |     |          | No-painting M10B5/10 M10B5/10          |  |
| Paint                       |                             |          |     |          | Standard                               |  |
| <Accessories>               |                             |          |     |          |  |  |
| Positioner                  |                             |          |     |          |  |  |
| Structure                   |                             |          |     |          |  |  |
| Input signal                |                             |          |     |          |  |  |
| Regulator                   |                             |          |     |          |  |  |
| Regulator2                  |                             |          |     |          |  |  |
| Limit switch                |                             |          |     |          |  |  |
| Action                      |                             |          |     |          |  |  |
| Solenoid valve              |                             |          |     |          |  |  |
| Action / Power              |                             |          |     |          |  |  |
| Booster                     |                             |          |     |          |  |  |
| Air lock valve              |                             |          |     |          |  |  |
|                             |                             |          |     |          |  |  |
|                             |                             |          |     |          |  |  |
| <Process data>              |                             |          |     |          |  |  |
| Fluid name/Phase            |                             | PROPANE  |     |          | FLASH(FCI)                             |  |
|                             | MAX                         | NOR      | MIN | Unit     |  |  |
| Flow rate                   | 1784                        |          |     | kg/h     |  |  |
| Inlet pressure              | 18.4                        |          |     | kgf/cm2A |  |  |
| Outlet pressure             | 5.95                        |          |     | kgf/cm2A |  |  |
| Differential press.         | 12.45                       |          |     | kgf/cm2  |  |  |
| Shut-off press.             | 20                          |          |     | kgf/cm2  |  |  |
| Temperature                 | 40                          |          |     | degC     |  |  |
| Density/Gravity(Liq)        | 0.467                       |          |     | water=1  |  |  |
| Density/Gravity(G,V)        | 44.1                        |          |     | MW       |  |  |
| Viscosity                   |                             |          |     | mPa-s    |  |  |
| Flash                       | 24.7                        |          |     | %        |  |  |
| Calculated CV               | 1.7793                      |          |     |          |  |  |
| Travel                      | 77                          |          |     | %        |  |  |
| Inlet velocity              | 3.845                       |          |     | m/s      |  |  |
| Predictive SPL              | 65                          |          |     | dBA      |  |  |
| <Piping spec.>              |                             |          |     |          |  |  |
|                             |                             |          |     |          |  |  |
|                             |                             |          |     |          |  |  |
|                             |                             |          |     |          |  |  |
|                             |                             |          |     |          |  |  |
| Strength Calc. Sheet        |                             |          |     |          |  |  |
| Design                      |                             |          |     |          | kgf/cm2G                               |  |
| Temp.                       |                             | -10 / 50 |     |          | degC                                   |  |
| Size                        |                             | 3/4 in.  |     | 3/4 in.  |  |  |
| Sch No.                     |                             | 40       |     | 40       |  |  |
| Thickness                   |                             | 2.9      |     | 2.9      |  |  |
| <b>Yamatake Corporation</b> |                             |          |     |          |  |  |