

Project: **Fire-safe test**

Client: **Metso Automation Oy**  
**Helsinki, Finland**

Office: **Helsinki**

Client's Order Number: -

Date: **15 January 2009**

Order Status: **Complete**

Inspection Dates

First: **23 October 2008**

Final: **23 October 2008**

This certificate is issued to **Metso Automation Oy** to certify that undersigned surveyor attended their works in Helsinki on the above date for purpose of witnessing fire tests of one (1) soft seated full bore ball valve manufactured by Metso Automation Oy Helsinki, Finland.

Particulars of valve

Type: **XM08CWTAJ2SPDTBA+D**

Rating: **ASME Class 150**

Size: **NPS 8"**

Materials (as stated by the Manufacturer): See Appendix No. 2 of the test report.

Testing

The test valve was presented by the manufacturer, without choice. The test was conducted in accordance with the standard ISO 10497-5: 2004- identical with API 607, Fifth Edition, June 2005. Throughout the test the valve performed satisfactorily and met all the requirements of the above standard. Visual examination after testing confirmed that the design was in accordance with the manufacturer's drawing and parts list. A Copy of the test report has been endorsed.

Before commencing the tests the testing apparatus was examined and found to be in accordance with the above standard.

This fire test qualifies also the following valve types:

**XM08 and larger sizes (ANSI 150)**

**XG08 and larger sizes (ANSI 300)**



Päivi Björkstam  
Surveyor to Lloyd's Register EMEA

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Form 1123 (2008.07)

## **FIRE TEST FOR BALL VALVE, TYPE XM08CWTAJ2SPDTBA+ D**

2 (4)

**OBJECT:** Fire test of ball valve XM08CWTAJ2SPDTBA+ D in accordance with standard ISO 10497- 5: 2004 - identical with API 607, Fifth Edition, June 2005.

**SPECIMEN:** The test valve XM08CWTAJ2SPDTBA+ D is a soft seated full bore ball valve manufactured by METSO AUTOMATION OY Helsinki, Finland. The valve is designed for bi-directional installation. The size of the valve is NPS 8" and pressure class of the body is ASME 150. The manual actuator M16 was mounted on the test valve.

The assembly drawing, parts list, dimensional drawing of the valve and dimensional drawing of the manual actuator are enclosed in Appendices 1, 2, 3 and 4. Nameplate details and location of temperature measurement points are shown in Appendix 5.

**TESTS:** The valve had been tested before the fire test by the manufacturer according to normal factory procedure.

The valve was assembled between two end flanges equipped with a 25 mm water pipe.

The valve was filled with water for the fire test and the pressure of water against the closed ball was 2 bar during the test. The test was conducted at the Laboratory of METSO AUTOMATION ( FC RTD ) OY Helsinki on October 23, 2008.

The temperatures and test pressures during the test were recorded with a data logger. The results are shown in Appendices 6. The temperature measurement points were located according to the test standard.

The flame temperature was raised to the required level in less than 2 minutes and after that the valve was heated with gas burners for 31 minutes and it was cooled with water-spray to lesser than 100 °C. The cooling time was 9 minutes.

**FIRE TEST FOR BALL VALVE,  
TYPE XM08CWTAJ2SPDTBA+ D**

3 (4)

The through-seat leakages and external leakages of the test valve during the test are shown in Table 1.

**TABLE 1.**  
October 23, 2008

| TEST PHASE                         | TIME | LEAKAGE  |         |
|------------------------------------|------|----------|---------|
|                                    | min. | ml/min   |         |
|                                    |      | measured | allowed |
| Start                              | 0    | 0        |         |
| Required flame temperature         | 2    | 0        |         |
| Seat leakage during heating        | 33   | 108      | 800     |
| External leakage heating + cooling | 42   | 8        | 200     |
| Seat leakage during cooling        | 42   | 4        | 160     |
| Seat leakage after cooling         | 47   | 1        | 320     |

In visual examinations after the test it was stated that the test valve was in full operating condition and complied with the supplied documents.

**SUMMARY:** On the basis of the results it can be stated that the tested ball valve XM08CWTAJ2SPDTBA met the requirements presented in standards ISO 10497- 5: 2004 and API 607, Fifth Edition, June 2005.

Juha Perttilä  
Laboratory Engineer  
METSO AUTOMATION OY  
FC RTD

Päivi Björkestam  
Surveyor to Lloyd's  
Register



**FIRE TEST FOR BALL VALVE,  
TYPE XM08CWTAJ2SPDTBA+ D**

4 (4)

**APPENDICES:**

1. Assembly drawing C FO7723
2. Parts and material list H029607
3. Dimension drawing C F04322
4. Manual actuators dimension drawing.
5. Nameplate details. Location of temperature measurement points.
6. Temperatures and pressure measurement results during the test.

(T1 and T2= Flame thermocouples,  
T3, T4 and T5 calorimeter cubes.  
P2= test pressure, P3= Centre cavity.)





Customer Parts list  
XM08CWTJ2SPDIBA  
BALL VALVE

Page

Id-code: H029607 Rev: 0  
So. no:

Project no:  
Customer/Order no:  
Tag no:

| Part | Id-code     | Description          | Material                 | Qty | Spare part categories |
|------|-------------|----------------------|--------------------------|-----|-----------------------|
| 001  | H013898     | BODY                 | ASTM A216 gr. WCB        | 1   |                       |
| 002  | H013946     | BODY CAP             | ASTM A216 gr. WCB        | 1   |                       |
| 003  | H014020     | BALL                 | ASTM A351 gr. CF8M       | 1   | 3                     |
| 005  | H014162     | SHAFT                | ASTM A479 gr. XM-19      | 1   | 3                     |
| 007  | H027235     | BALL SEAT            | AISI 316+PTFE            | 2   |                       |
| 000  | H027206     | SEAT BODY            | AISI 316                 | 1   |                       |
| 000  | H024836     | BALL SEAT            | PTFE                     | 1   |                       |
| 008  | H002166     | BONNET               | EN10025-S355J2G3/A675-70 | 1   |                       |
| 009  | 46280       | GLAND                | A351 gr. CF8M/1.4408     | 1   |                       |
| 010  | 3146        | KEY                  | SS 142324                | 1   | 3                     |
| 012  | 3913        | STUD                 | ASTM A193 gr. B7         | 12  |                       |
| 013  | 231807      | STUD                 | ASTM A193 gr. B7         | 4   |                       |
| 014  | H002070     | STUD                 | ASTM A193 gr. B7         | 2   |                       |
| 016  | 3345        | HEXAGON NUT HEAVY    | ASTM A194 gr. 2H         | 12  |                       |
| 017  | 3343        | HEXAGON NUT HEAVY    | ASTM A194 gr. 2H         | 4   |                       |
| 018  | 3342        | HEXAGON NUT HEAVY    | ASTM A194 gr. 2H         | 2   |                       |
| 019  | H028251     | IDENTIFICATION PLATE | AISI 304                 | 1   |                       |
| 062  | 1095141     | SPRING               | UNS N06625               | 2   |                       |
| 063  | 232678      | O-RING               | VITON GF (FKM)           | 2   |                       |
| 064  | 200843      | STRIP                | PTFE                     | 2   |                       |
| 065  | 004-0590-36 | BODY GASKET          | GRAPHITE-AISI 316        | 1   |                       |
| 066  | 236996      | SHEET RING           | GRAPHITE-AISI 316        | 1   |                       |
| 069  | 233407      | PACKING RING         | GRAPHITE-PTFE            | 4   |                       |
| 070  | H002288     | THRUST BEARING       | STELL 6B                 | 1   | 3                     |
| 071  | H002290     | THRUST BEARING       | UNS S21800               | 1   | 3                     |
| 077  | 3601        | HEXAGON PLUG         | DIN 1652-1.0050 K        | 0   |                       |
| 089  | H014223     | TRUNNION PLATE       | ASTM A743 gr. CA15       | 2   |                       |

Spare part categories: 1 = Recommended soft spares (always needed), 2 = Basic repair (eg. changing of the seat/valve or levers/actuators), 3 = Full repair (eg. changing of the closing element/valve). For full overhaul = select categories 1 + 2 + 3



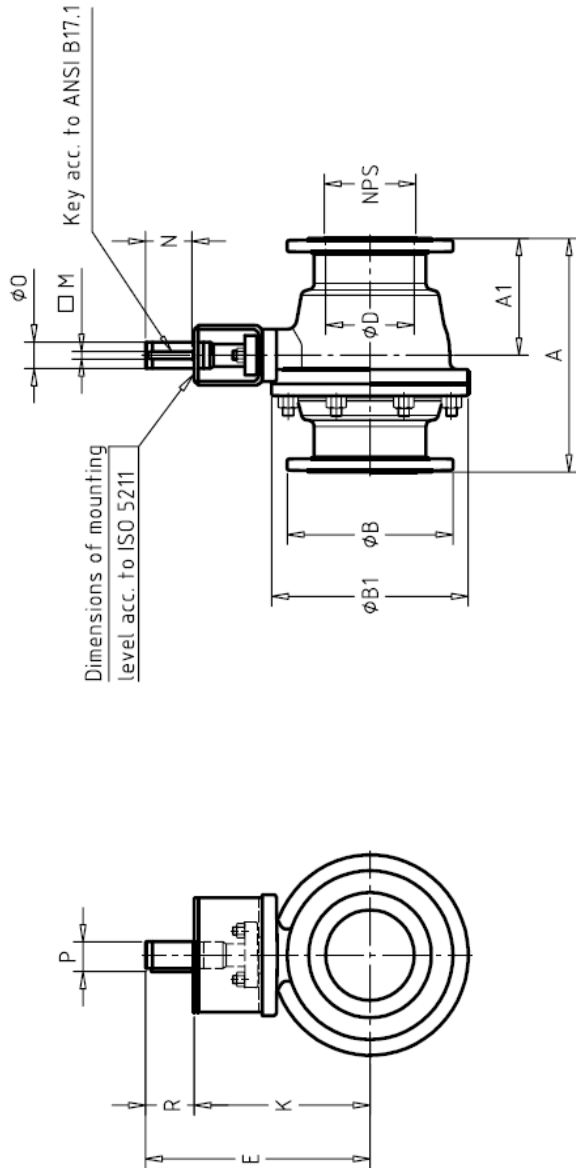
Customer Parts list  
XM08CWTJA2SPDTBA  
BALL VALVE

Page

Id-code: H029607  
Rev: 0  
So. no:

Project no:  
Customer/Order no:  
Tag no:

| Part       | Id-code | Description                          | Material            | Qty | Spare part categories |
|------------|---------|--------------------------------------|---------------------|-----|-----------------------|
| 091        | 1192980 | THRUST BEARING                       | STELL 6B            | 2   | 3                     |
| 099        | H000691 | TRUNNION BEARING                     | PTFE-AISI 316       | 2   | 3                     |
| 129        | H028557 | RING                                 | AISI 316            | 2   |                       |
| 130        | 819760  | BACK SEAL                            | GRAFOIL N           | 2   |                       |
| 150        | 979560  | DISC SPRING SET                      | EN 10083-1.8159+ENP | 2   |                       |
| Documents: | F07723  | TRUNNION BALL VALVE XG/XM-SERIES     |                     |     |                       |
|            |         | XG 02" - 16", XM 08" - 16", DN50-400 |                     |     |                       |
|            |         | SOFT SEAT FIRE SAFE APPLICATION      |                     |     |                       |



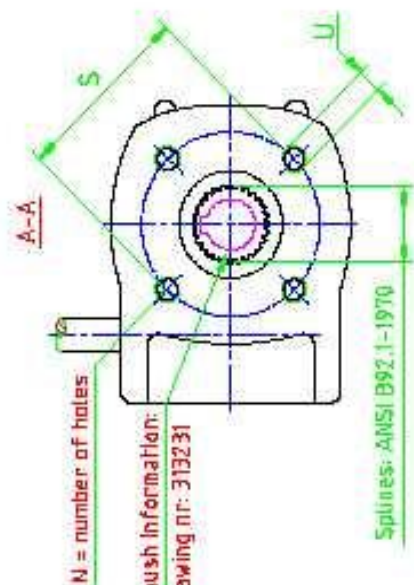
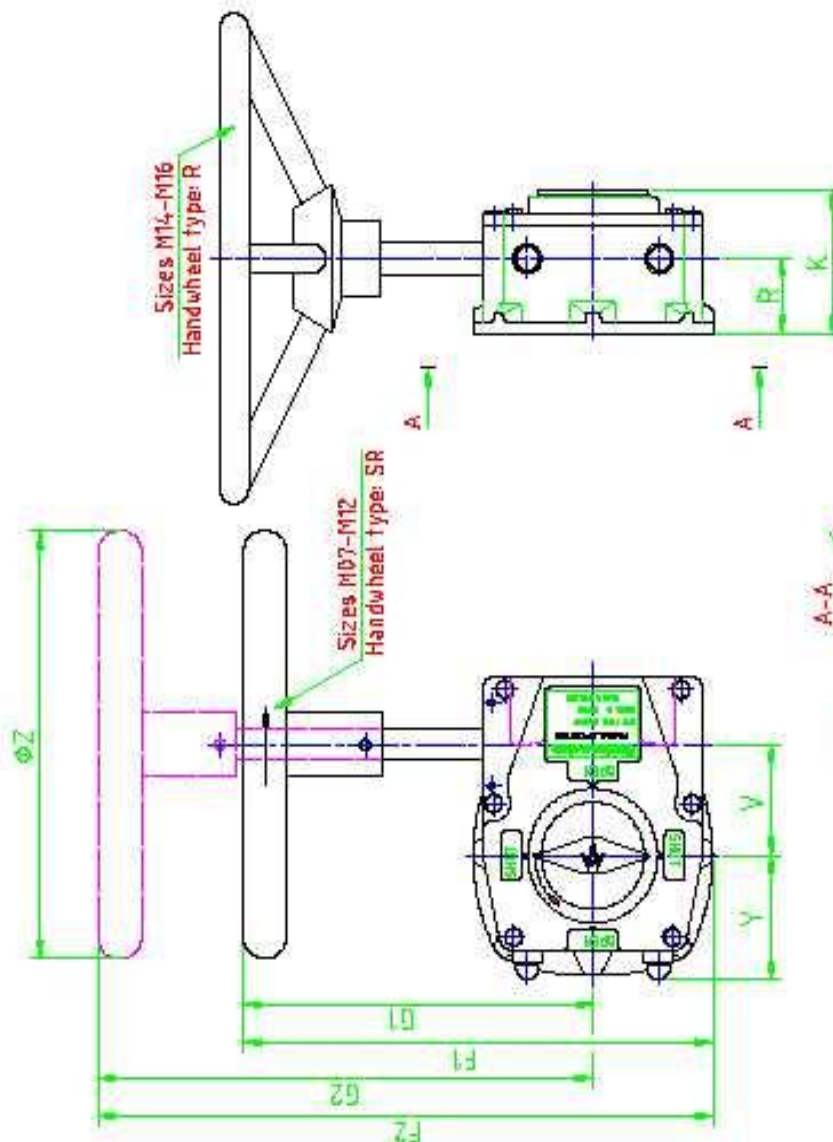
| TYPE | DN  | DIMENSIONS mm |       |       |     |       |     |     |        |     |    |        | Kg   |
|------|-----|---------------|-------|-------|-----|-------|-----|-----|--------|-----|----|--------|------|
|      |     | A             | A1    | ØB    | ØB1 | ØD    | E   | K   | TM     | N   | P  | R      |      |
| XG   | 50  | 216           | 89    | 165.1 | 146 | 50.8  | 203 | 168 | 4.763  | 35  | 20 | 22.163 | 15   |
|      | 80  | 282           | 142   | 209.6 | 200 | 76.2  | 275 | 190 | 4.763  | 35  | 20 | 22.163 | 32   |
|      | 100 | 305           | 152.5 | 254   | 254 | 101.6 | 296 | 250 | 6.35   | 46  | 25 | 27.75  | 58   |
|      | 150 | 403           | 201.5 | 317.5 | 353 | 152.4 | 373 | 305 | 9.525  | 68  | 40 | 44.225 | 125  |
|      | 200 | 502           | 251   | 381   | 462 | 203.2 | 453 | 385 | 9.525  | 68  | 40 | 44.225 | 225  |
|      | 250 | 568           | 284   | 445   | 552 | 254   | 562 | 472 | 12.7   | 90  | 55 | 60.6   | 330  |
|      | 300 | 648           | 324   | 521   | 626 | 304.8 | 605 | 515 | 12.7   | 90  | 55 | 60.6   | 610  |
|      | 350 | 762           | 381   | 584   | 700 | 340   | 741 | 607 | 19.05  | 134 | 75 | 83.15  | 800  |
|      | 400 | 838           | 419   | 648   | 800 | 390   | 779 | 633 | 22.225 | 146 | 85 | 94.625 | 1015 |

| TYPE | DN  | DIMENSIONS mm |     |     |     |       |     |     |        |     |    |        | Kg  |
|------|-----|---------------|-----|-----|-----|-------|-----|-----|--------|-----|----|--------|-----|
|      |     | A             | A1  | ØB  | ØB1 | ØD    | E   | K   | TM     | N   | P  | R      |     |
| XM   | 200 | 457           | 229 | 343 | 426 | 203.2 | 453 | 385 | 9.525  | 68  | 40 | 44.225 | 190 |
|      | 250 | 533           | 267 | 407 | 514 | 254   | 562 | 472 | 12.7   | 90  | 55 | 60.6   | 325 |
|      | 300 | 610           | 305 | 483 | 592 | 304.8 | 605 | 515 | 12.7   | 90  | 55 | 60.6   | 480 |
|      | 350 | 686           | 343 | 533 | 665 | 340   | 741 | 607 | 19.05  | 134 | 75 | 83.15  | 635 |
|      | 400 | 762           | 381 | 597 | 750 | 390   | 779 | 633 | 22.225 | 146 | 85 | 94.625 | 840 |

Page 2 contains same information in imperial units. This is a page 1/2

FACE-TO-FACE DIMENSIONS ACC. TO ASME B16.10  
 PRESSURE RATINGS: XG= ASME 300, XM=ASME150  
 FLANGED, FULL BORE  
 Valve is shown in closed position

|                           |  |              |     |                  |                |
|---------------------------|--|--------------|-----|------------------|----------------|
| P&W DATE 30.10.2000       |  | PRINT DWN    | RLS | TARK. CHECK. RKM | HYV. APPR. TJP |
| BALL VALVE XM/XG 2" - 16" |  | ENT. GLD NO. |     | USIS NEW NO.     |                |
| DIMENSION DRAWING         |  |              |     |                  |                |
| C F04322                  |  |              |     |                  |                |
| Nefas Field Controls Oy   |  |              |     |                  |                |
| HELENI FINLAND            |  |              |     |                  |                |
| MICROFILM                 |  |              |     |                  |                |
| MULTIS ISSUE              |  |              |     |                  |                |



Drive bush information:  
See drawing nr: 313231

Splines: ANSI B92.1-1970

| UNIT SIZE                    | M07       | M10       | M12       | M14       | M15       | M16         |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-------------|
| INPUT TORQUE, M [Nm]         | 22,7      | 45,5      | 88,5      | 111       | 166       | 170         |
| MAX OUTPUT TORQUE, M [Nm]    | 294       | 500       | 1000      | 1600      | 3600      | 4500        |
| TURNS TO CLOSE               | 10        | 10        | 10,5      | 15        | 17        | 22          |
| HANDWHEEL DIA 2"             | 125       | 200       | 250       | 457       | 457       | 670         |
| EL WITH STANDARD INPUT SHAFT | 65,2      | 169       | 200       | 278       | 331       | 391         |
| F1 WITH STANDARD INPUT SHAFT | 196       | 227       | 285       | 378       | 457       | 549         |
| D2 WITH EXTENDED INPUT SHAFT | -         | 234       | 282       | 354       | 406       | 466         |
| D3 WITH EXTENDED INPUT SHAFT | -         | 297       | 357       | 453       | 532       | 624         |
| V                            | 38,5      | 52        | 64,7      | 89,5      | 123       | 154         |
| Y                            | 45        | 50        | 75        | 86        | 116       | 117         |
| K                            | 58        | 67        | 81        | 93,5      | 105,5     | 124,5       |
| R                            | 24,5      | 35        | 42        | 50        | 50        | 54          |
| MAX STEM HEIGHT              | 57        | 57        | 72        | 81        | 92        | 113         |
| MAX VALVE SHAFT DIA          | 25        | 25        | 30        | 45        | 55        | 70          |
| SPLINES: ANSI B92.1-1970     | 20T 28/48 | 20T 28/48 | 20T 36/32 | 40T 36/32 | 40T 50/24 | 40T 50/24   |
| WEIGHT (kg)                  | 2,9       | 5         | 9,5       | 18        | 30,1      | 45,2        |
| VALVE MOUNTING FLOOSE        | F05 F07   | F10       | F12       | F14       | F16       | F16 F25     |
| ISO 52M TYPE                 | 50 10     | 102       | 125       | 140       | 125 115   | 165 165 254 |
| N, NUMBER OF HOLES           | 6         | 6         | 4         | 4         | 4         | 4           |
| U DIA                        | 196       | 110       | 110       | 116       | 112 120   | 116         |
| U DEPTH                      | 9         | 13        | 16        | 21,5      | 23        | 25          |

NOTE: LOOK ALSO DRAWING NR. 313230 ABOUT STANDARD AND SPECIAL MODELS  
LOOK ALSO DRAWING NR. 313231 ABOUT STANDARD AND MBV DRIVE BUSHES

MASTERGEAR MANUAL OPERATOR  
SERIES M07...M16

DIMENSION DRAWING

**NELES-LAMSBURY**

|           |      |    |      |           |    |      |
|-----------|------|----|------|-----------|----|------|
| REV.      | DATE | BY | CHKD | DATE      | BY | CHKD |
| 1         |      |    |      |           |    |      |
| C 313229  |      |    |      |           |    |      |
| REVISIONS |      |    |      | REVISIONS |    |      |
| REVISIONS |      |    |      | REVISIONS |    |      |

## NAMEPLATE DETAILS

TYPE : XM08CWTAJ2SPDTBA+D

No. : H029607

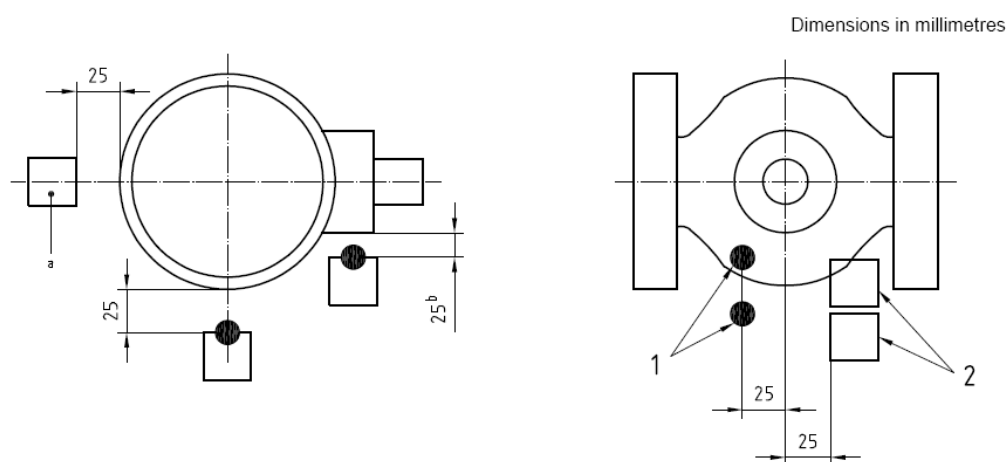
BODY : \_WCB\_ Tmax : \_+200 °C\_

TRIM : \_316\_ Tmin : \_-29 °C\_

SHAFT : \_XM - 19\_ RATING: \_ASME 150\_

SEAT : \_316+PTFE\_ dPs : \_19.6 BAR\_

ISO 10497:2004(E)

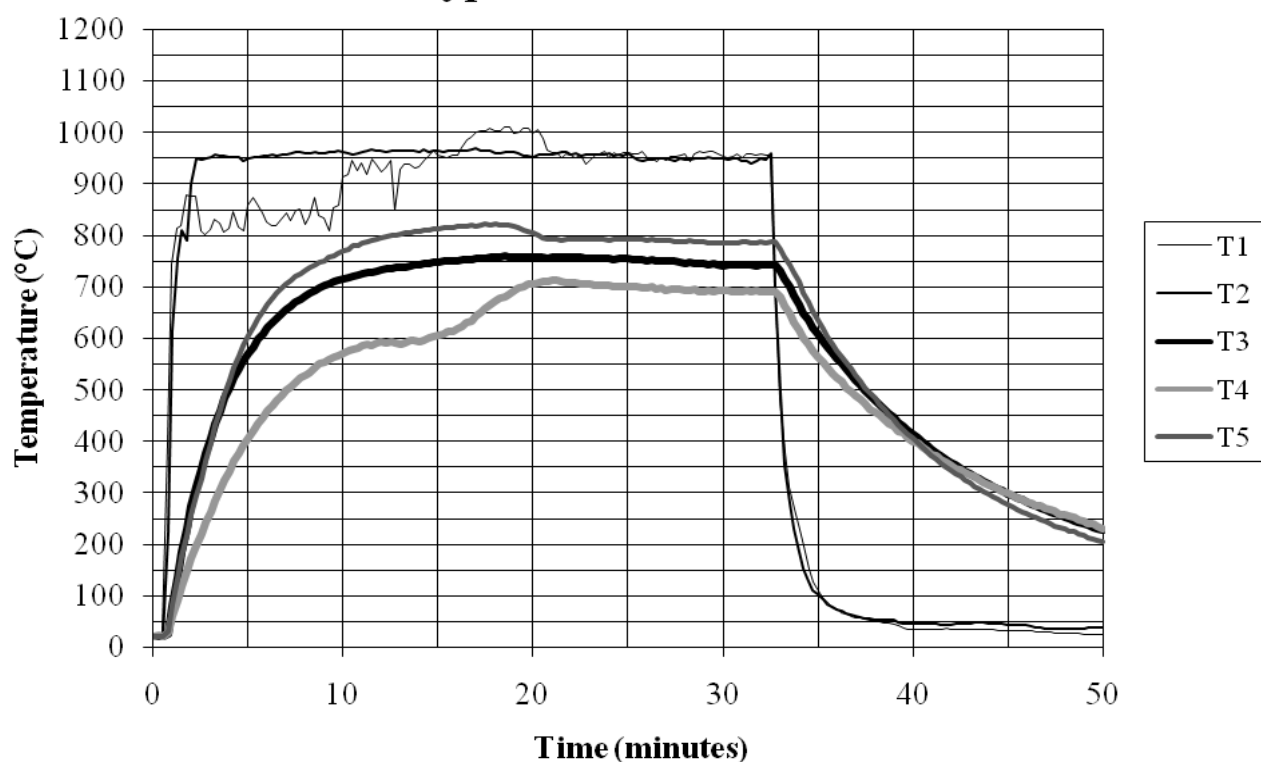


**Key**

- 1 flame thermocouples
- 2 38 mm calorimeter cubes
- a Additional calorimeter cube added for DN 200 (8 in) and above.
- b From the stem seal.

**Figure 4 — Location of temperature measurement sensors for all other valves (soft-seated valves larger than DN 100, NPS 4, PN 10, PN 16, PN 25 and PN 40, Class 150 and Class 300, and all valve sizes > PN 40, Class 300)**

**Test -Temperature-graph**  
**Valve type: XM08CWTAJ2SPDTBA**



**Test -Pressure-graph**

