

## DESCRIPTION OF THE COMPARATIVE TABLES OF TESTS DESCRIZIONE TABELLE COMPARATIVE PROVE

Giussani test benches are designed to check and test components of **sanitary taps** and hydraulic devices in general, according to the procedures imposed by the main international Standards.

Depending on the type of test and the device to be test, the AQ2tb software guides the user in the choice of all the significant parameters characterizing the test itself.

The attached tables contain a summary description of the main tests with:

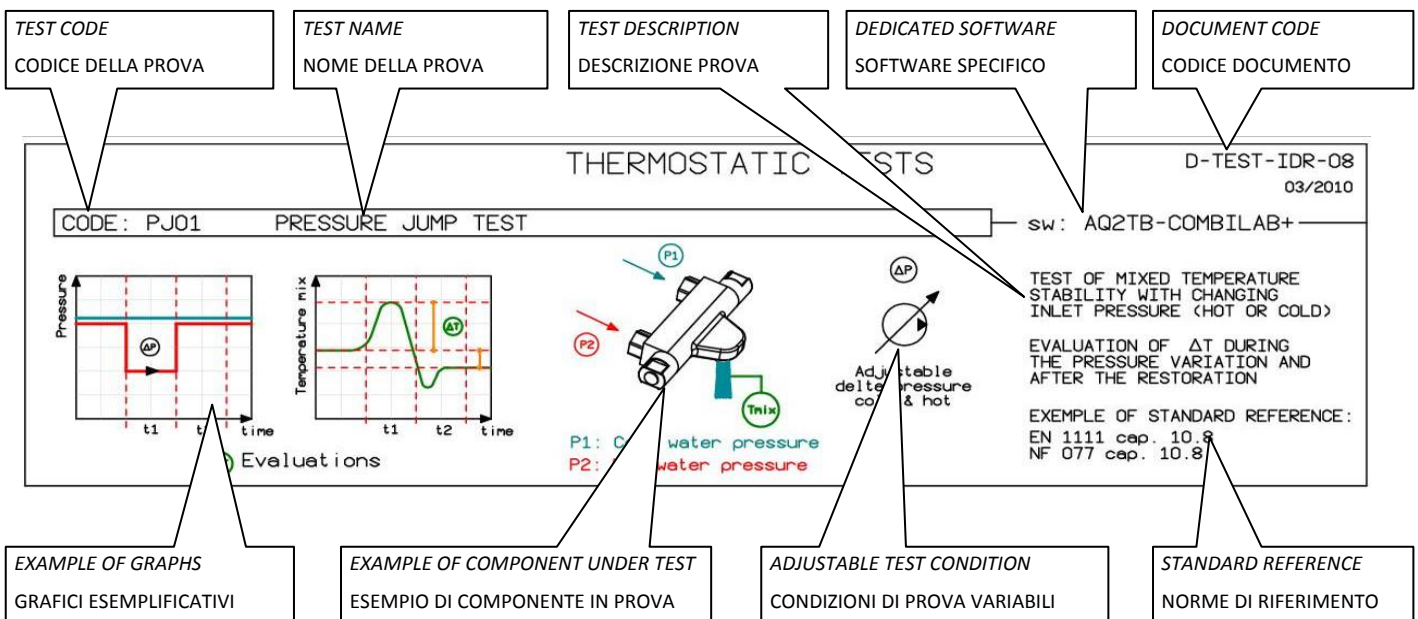
- The graphical representation of the physical quantities measured.
- The example drawing of the installation of the device under test .
- The base operative range and the maximum achievable performance for each test bench.
- The main reference Standards.

I banchi prova Giussani sono realizzati per testare e collaudare componenti di **rubinetteria idrosanitaria** e componenti idraulici in genere, secondo le procedure imposte dalle principali Norme di settore.

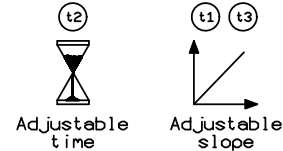
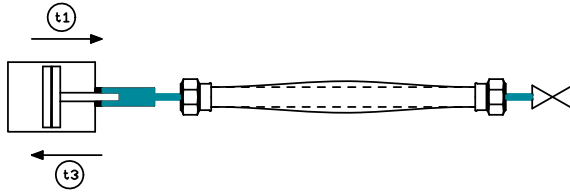
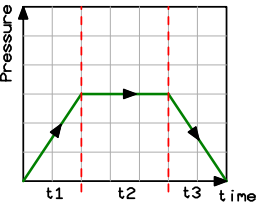
In funzione del tipo di prova e del componente da testare, il software AQ2tb guida l'utente nella scelta di tutti i parametri significativi che caratterizzano la prova stessa.

- Le tabelle allegate contengono una descrizione sintetica delle principali prove con:
- La rappresentazione grafica delle grandezze misurate.
- Lo schizzo esemplificativo dell'installazione del componente.
- I campi operativi delle versioni base e le prestazioni massime raggiungibili.
- Le principali Norme di riferimento.

## EXPLANATION OF TESTS SPIEGAZIONE PROVE

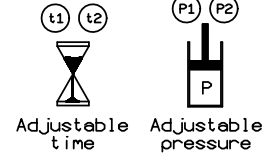
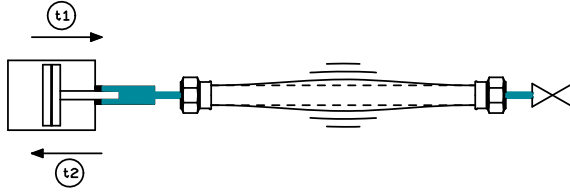
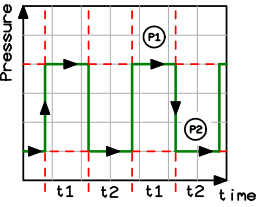


CODE: P01 STATIC TEST sw: AQ2TB-STATICAUT



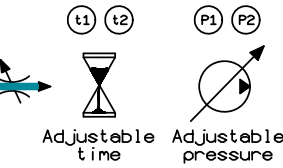
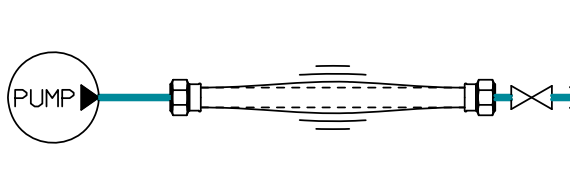
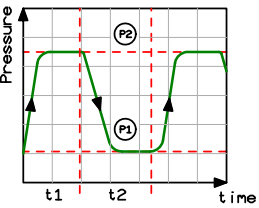
PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 / 800 bar

CODE: P02 PULSING TEST sw: AQ2TB-PULSEAUT



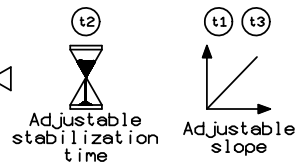
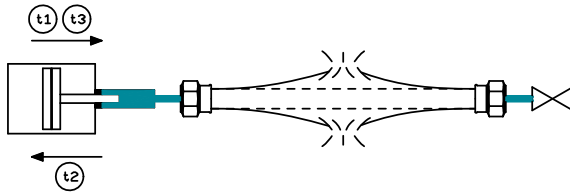
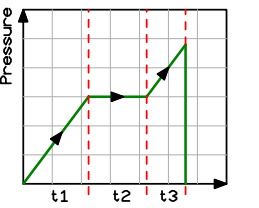
PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 bar

CODE: P03 CYCLING TEST sw: AQ2TB-PULSEAUT



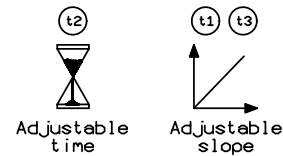
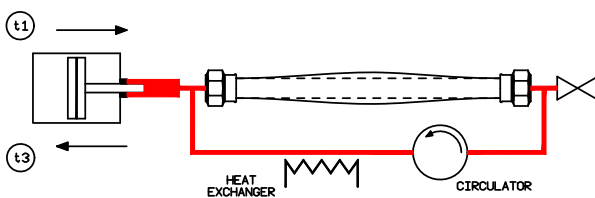
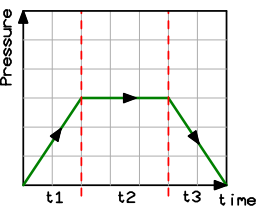
PRESSURE OPERATING RANGE  
BASE MODEL: 10 bar  
EXTENSION TO: 20 bar

CODE: P04 BURST TEST sw: AQ2TB-EXP-PROD



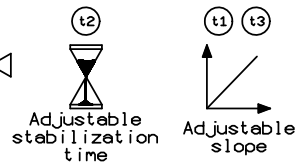
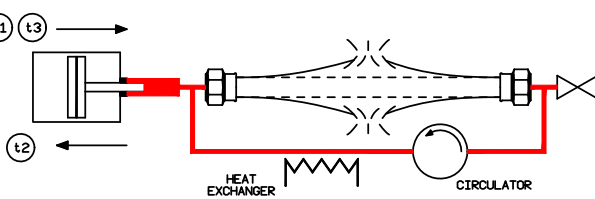
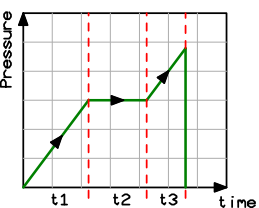
PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 / 800 bar

CODE: P01-HPF STATIC TEST WITH HOT WATER CIRCULATION sw: AQ2TB-STATIC-EH



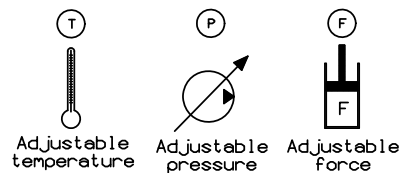
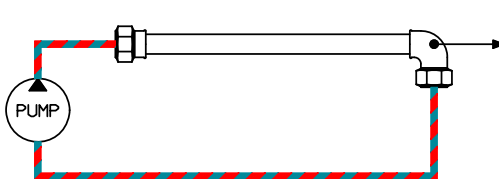
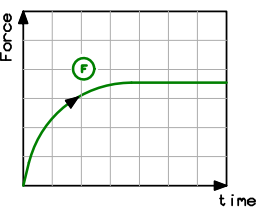
PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 / 800 bar

CODE: P04-HPF BURST TEST WITH HOT WATER CIRCULATION sw: AQ2TB-EXP-PRODH



PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 / 800 bar

CODE: AXT01 AXIAL TENSILE TEST sw: AQ2TB-AT-LAB

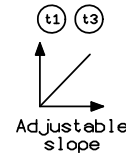
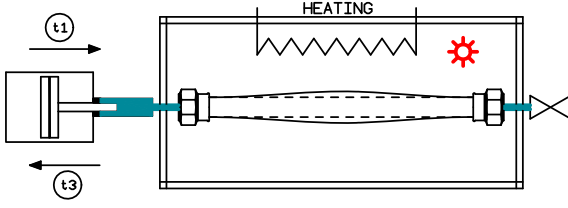
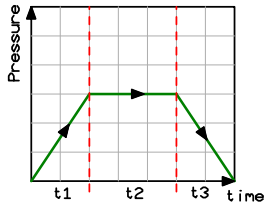


TEST RANGE  
FORCE: 10 - 5000 N  
TEMPERATURE: 10 - 95 °C  
PRESSURE: 1 - 20 bar

CODE: PT01

STATIC TEST

sw: AQ2TB-STATICAUT

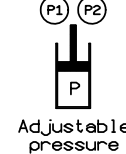
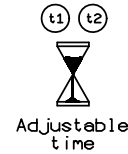
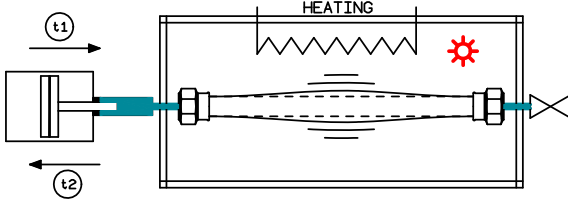
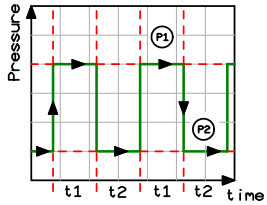


PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 / 800 bar  
WATER TEMPERATURE: Room Temp.

CODE: PT02

PULSING TEST

sw: AQ2TB-PULSEAUT

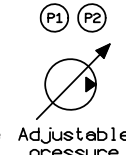
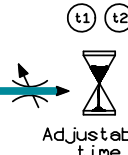
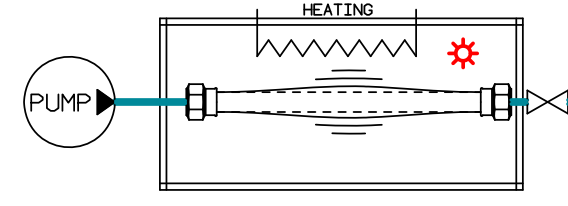
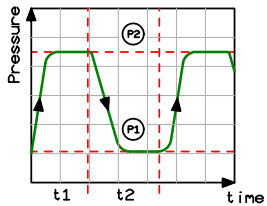


PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 bar  
WATER TEMPERATURE: Room Temp.

CODE: PT03

CYCLING TEST

sw: AQ2TB-PULSEAUT

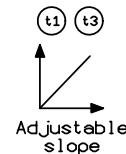
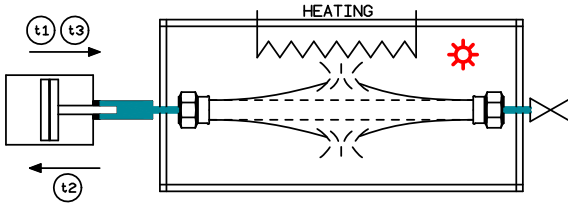
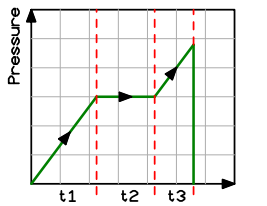


PRESSURE OPERATING RANGE  
BASE MODEL: 10 bar  
EXTENSION TO: 20 bar  
WATER TEMPERATURE: Room Temp.

CODE: PT04

BURST TEST

sw: AQ2TB-STATICAUT

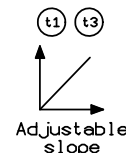
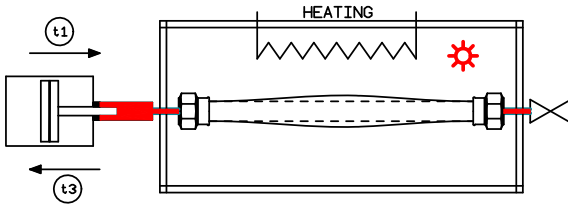
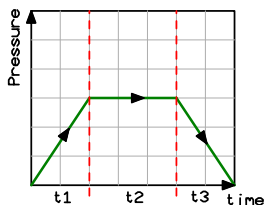


PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 / 800 bar  
WATER TEMPERATURE: Room Temp.

CODE: PT01H

STATIC TEST

sw: AQ2TB-STATICAUT

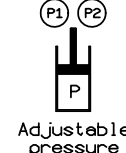
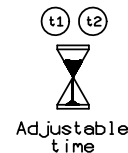
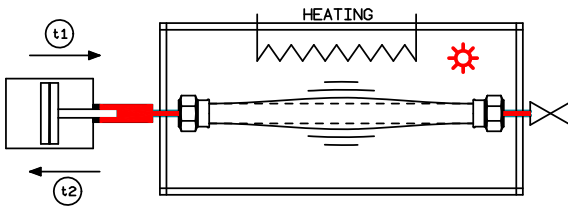
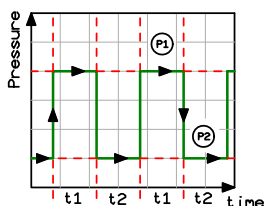


PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 bar  
ADJUSTABLE WATER TEMPERATURE:  
up to 95 °C

CODE: PT02H

PULSING TEST

sw: AQ2TB-PULSEAUT

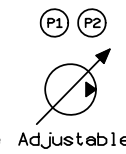
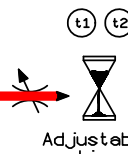
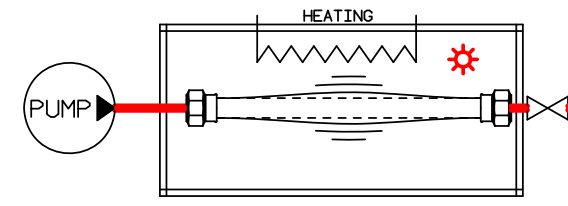
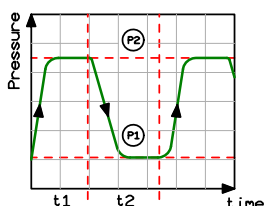


PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 bar  
ADJUSTABLE WATER TEMPERATURE:  
up to 95 °C

CODE: PT03H

CYCLING TEST

sw: AQ2TB-PULSEAUT

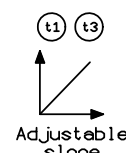
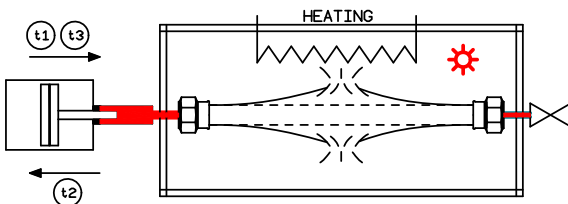
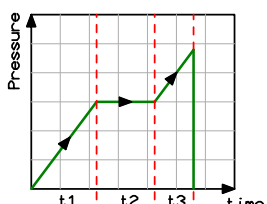


PRESSURE OPERATING RANGE  
BASE MODEL: 10 bar  
EXTENSION TO: 20 bar  
ADJUSTABLE WATER TEMPERATURE:  
up to 95 °C

CODE: PT04H

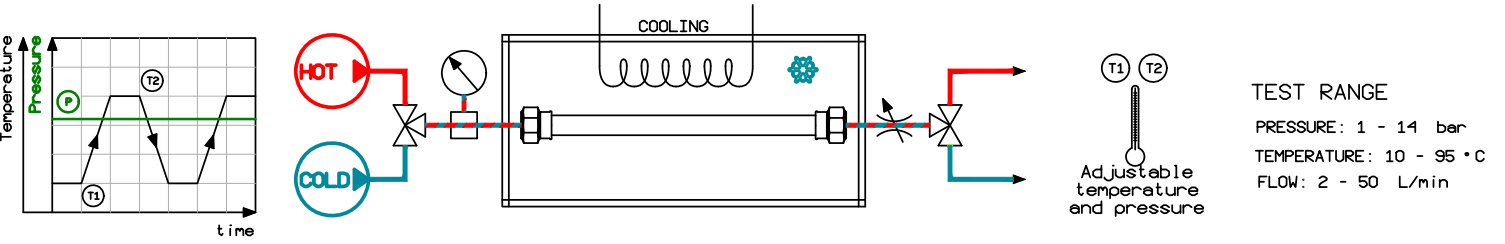
BURST TEST

sw: AQ2TB-STATICAUT

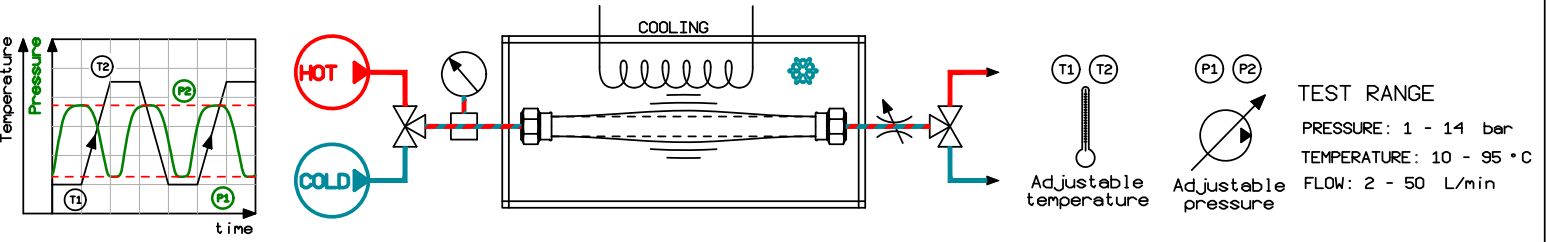


PRESSURE OPERATING RANGE  
BASE MODEL: 150 bar  
EXTENSION TO: 250 / 400 / 800 bar  
ADJUSTABLE WATER TEMPERATURE:  
up to 95 °C

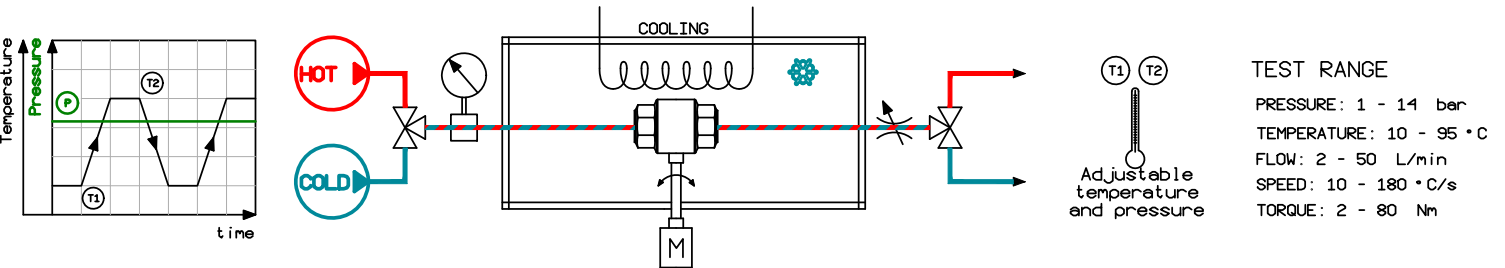
CODE: TC01 THERMAL CYCLE TEST EN 12293 sw: AQ2TB-EN12293



CODE: TC02 THERMAL CYCLE TEST + PULSING PRESSURE sw: AQ2TB-\*

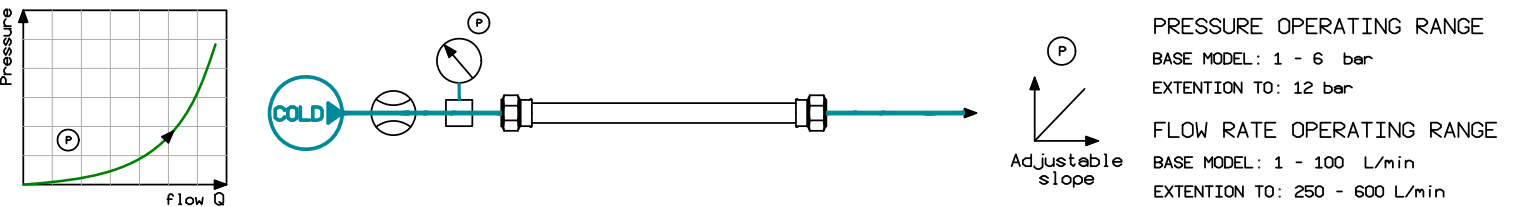


CODE: TC03 THERMAL CYCLE & ENDURANCE TEST EN 13828 sw: AQ2TB-LVALVE

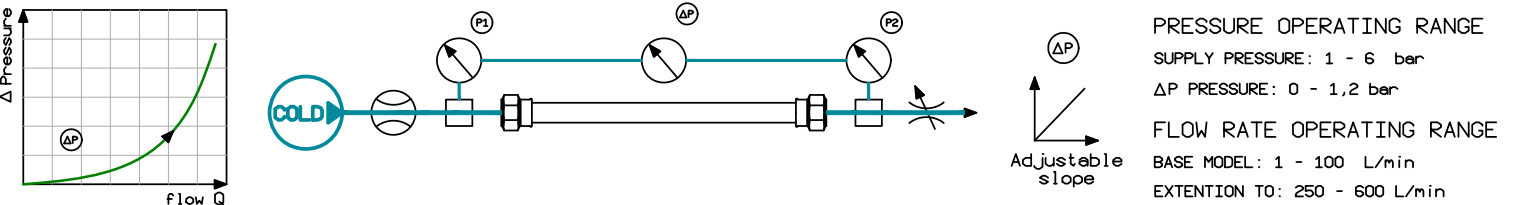


FLOW RATE TESTS

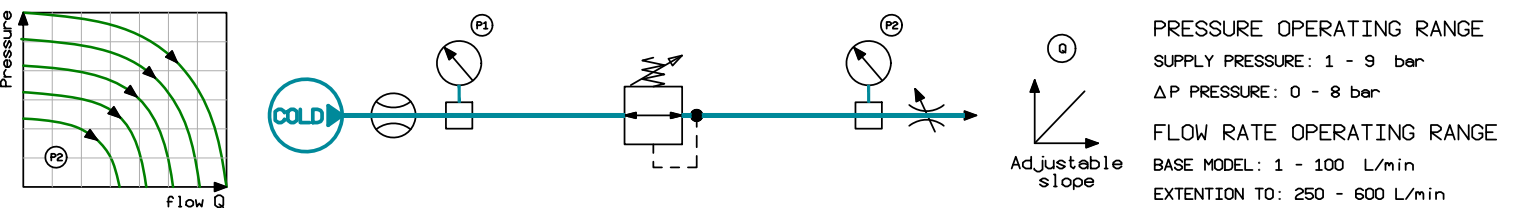
CODE: F01 FLOW RATE AT DIFFERENT PRESSURE sw: AQ2TB-FLOW-LIN



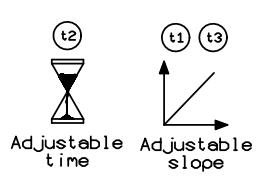
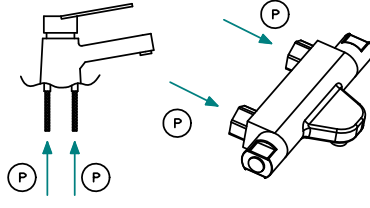
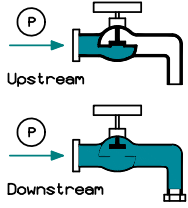
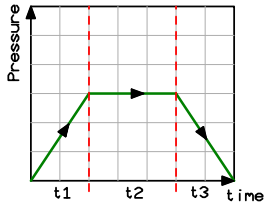
CODE: F02 FLOW RATE AT DIFFERENT ΔP PRESSURE sw: AQ2TB-KV-LAB



CODE: F03 PRESSURE AT DIFFERENT FLOW RATE sw: AQ2TB-P.outFLOW



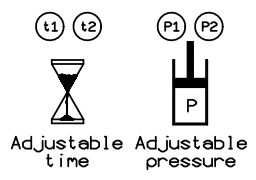
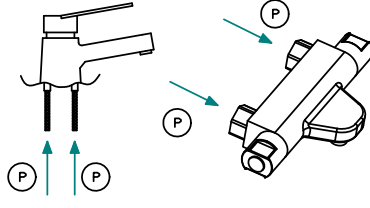
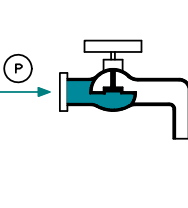
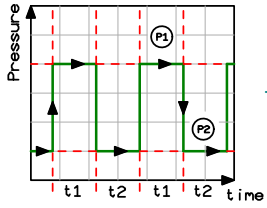
CODE: P01 STATIC TEST sw: AQ2TB-STATICAUT



PRESSURE OPERATING RANGE  
UPSTREAM of the obturator: 0-16 bar  
DOWNSTREAM of the obturator: 0-25 bar

EXAMPLE OF STANDARD REFERENCE:  
EN 200 cap. 8 - 9  
EN 817 cap. 8 - 9  
EN 1111 cap. 9 - 11

CODE: P02 PULSING TEST sw: AQ2TB-PULSEAUT

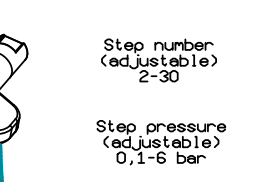
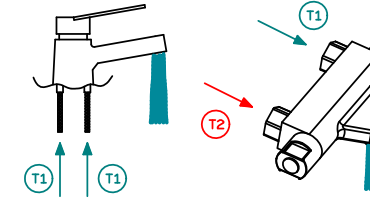
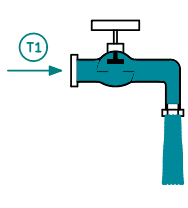
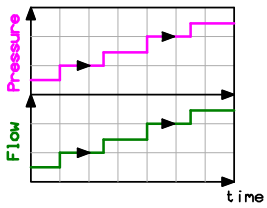


PRESSURE OPERATING RANGE  
Minimum pressure: 0-8 bar  
Maximum pressure: 2-50 bar

EXAMPLE OF STANDARD REFERENCE:  
NF 077 2-3 - Classement ECAU

Cold water

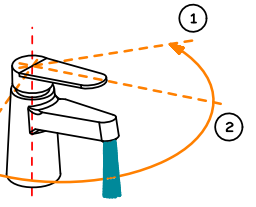
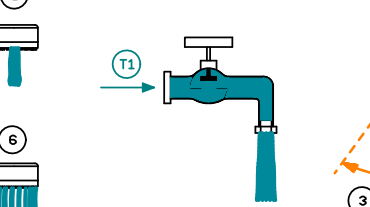
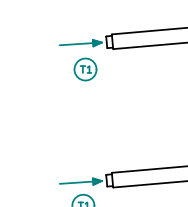
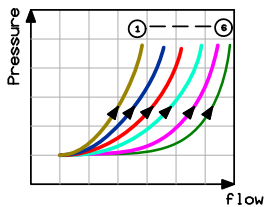
CODE: F05 FLOW TEST - STEP PRESSURE sw: AQ2TB-FLOW-STEP



EXAMPLE OF STANDARD REFERENCE:  
EN 200 cap. 10 - cold water  
EN 817 cap. 10.6 - cold & hot water  
EN 1111 cap. 10.5 - cold & hot water

T1: Cold water temperature  
T2: Hot water temperature

CODE: F06 FLOW TEST - LINEAR PRESSURE sw: AQ2TB-FLOW-LIN

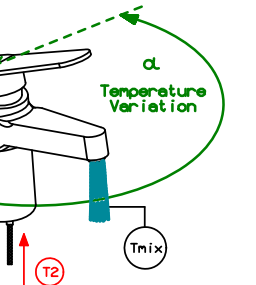
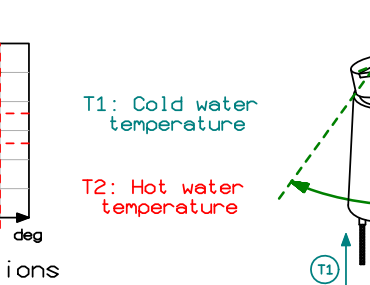
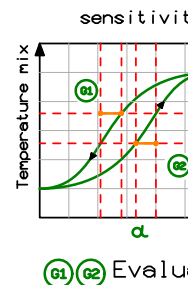
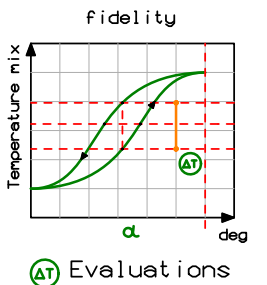


PRESSURE RANGE:  
0,1-6 bar

EXAMPLE OF STANDARD REFERENCE  
EN 200 cap. 10

T1: Cold water temperature

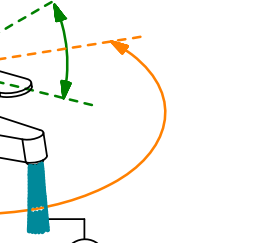
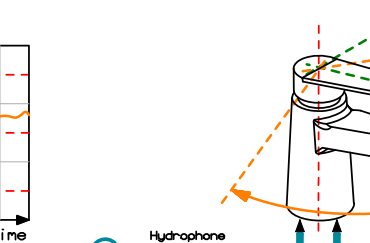
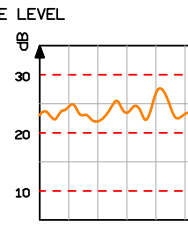
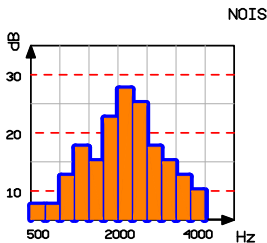
CODE: SF01 SENSITIVITY & FIDELITY TEST sw: AQ2TB-COMBILAB+ sw: AQ2TB-F+S-DRIVE



TEST OF MIXED TEMPERATURE  
HISTERESYS AND SENSITIVITY  
BY MOVING THE TEMPERATURE  
SETTING DEVICE FROM COLD TO  
HOT POSITION AND RETURNING TO  
INITIAL POSITION

EXAMPLE OF STANDARD REFERENCE  
EN 817 cap. 10.7  
EN 1111 cap. 10.6

CODE: AT01 ACOUSTIC TEST sw: AQ2TB-NOISE



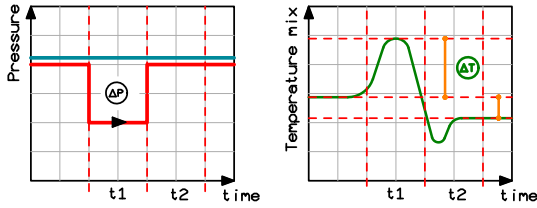
MEASUREMENT OF NOISE  
EMISSION FROM APPLIANCE  
AND EQUIPMENT USED IN  
WATER SUPPLY INSTALLATIONS

EXAMPLE OF STANDARD REFERENCE  
EN 200 cap. 14  
EN 817 cap. 14  
EN 1111 cap. 14

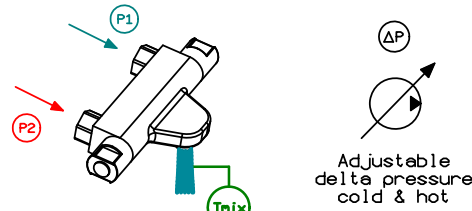
T1: Cold water temperature

CODE: PJ01 PRESSURE JUMP TEST

sw: AQ2TB-COMBILAB+



ΔT Evaluations



P1: Cold water pressure  
P2: Hot water pressure

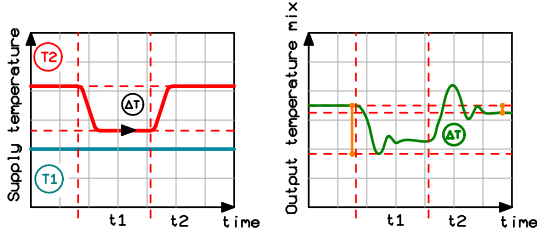
TEST OF MIXED TEMPERATURE STABILITY WITH CHANGING INLET PRESSURE (HOT OR COLD)

EVALUATION OF  $\Delta T$  DURING THE PRESSURE VARIATION AND AFTER THE RESTORATION

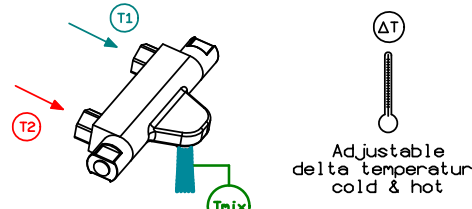
EXAMPLE OF STANDARD REFERENCE:  
EN 1111 cap. 10.8  
NF 077 cap. 10.8

CODE: TJ01 TEMPERATURE JUMP TEST

sw: AQ2TB-COMBILAB+



ΔT Evaluations



T1: Cold water temperature  
T2: Hot water temperature

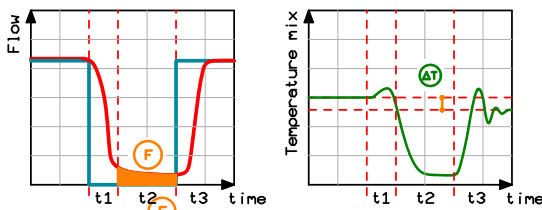
TEST OF MIXED TEMPERATURE STABILITY WITH CHANGING INLET TEMPERATURE (HOT OR COLD)

EVALUATION OF  $\Delta T$  DURING THE PRESSURE VARIATION AND AFTER THE RESTORATION

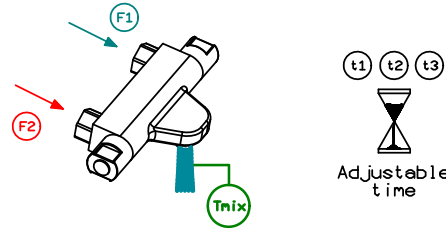
EXAMPLE OF STANDARD REFERENCE:  
EN 1111 cap. 10.9  
NF 077 cap. 10.9

CODE: ST01 SAFETY TEST

sw: AQ2TB-COMBILAB+  
sw: AQ2TB-M-LAB-NF+  
sw: AQ2TB-M-LAB-DO8



ΔT Evaluations



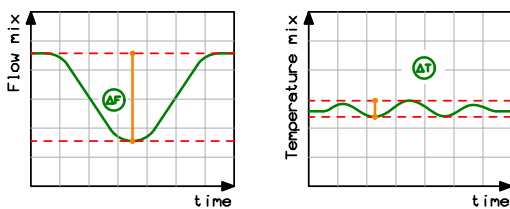
F1: Cold water flow  
F2: Hot water flow

TEST OF SAFETY WITH COLD WATER FAILURE AND RESTORATION WITH EVALUATION OF HOT WATER COLLECTED DURING t2 AND  $\Delta T$  MIXED AFTER COLD WATER RESTORATION

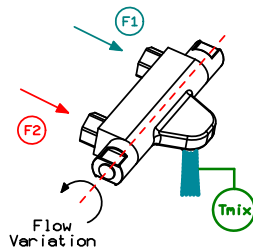
EXAMPLE OF STANDARD REFERENCE:  
EN 1111 cap. 10.7  
NF 077 cap. 10.7  
NHS-DO8 cap. 7.7

CODE: FV01 FLOW RATE VARIATION TEST

sw: AQ2TB-COMBILAB+



ΔT Evaluations



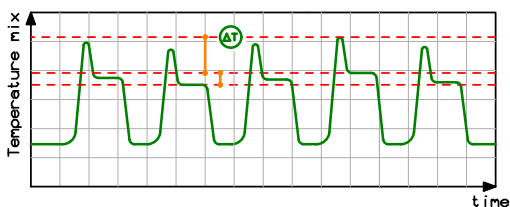
TEST OF MIXED TEMPERATURE STABILITY WITH FLOW RATE VARIATION

EXAMPLE OF STANDARD REFERENCE  
prEN 1111\_2006 cap. 12.5.3  
NF 077 cap. 10.10

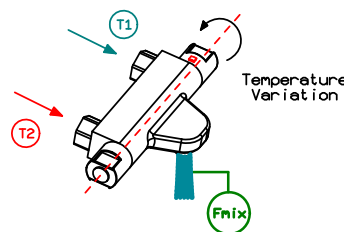
F1: Cold water flow  
F2: Hot water flow

CODE: TV01 TEMPERATURE VARIATION TEST

sw: AQ2TB-COMBILAB+



ΔT Evaluations



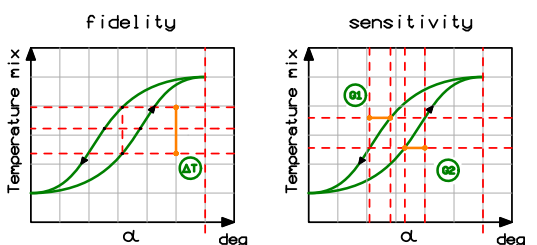
TEST OF TEMPERATURE OVERRIDE STOP WITH EVALUATION OF TEMPERATURE TRANSIENT AND FINAL TEMPERATURE

EXAMPLE OF STANDARD REFERENCE  
prEN 1111\_2006 cap. 12.5.7  
NF 077 cap. 10.12

T1: Cold water temperature  
T2: Hot water temperature

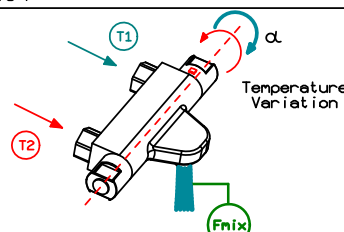
CODE: SF02 SENSITIVITY & FIDELITY TEST

sw: AQ2TB-COMBILAB+  
sw: AQ2TB-F+S-DRIVE



ΔT Evaluations

G1 G2 Evaluations



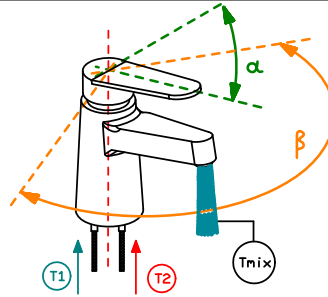
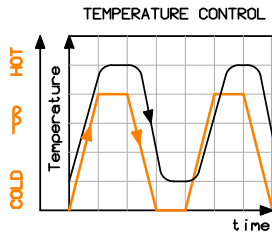
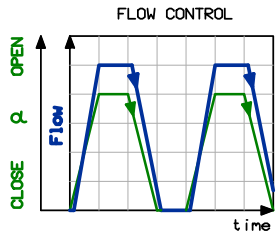
T1: Cold water temperature  
T2: Hot water temperature

TEST OF MIXED TEMPERATURE HISTERESYS AND SENSITIVITY BY MOVING THE TEMPERATURE SETTING DEVICE FROM COLD TO HOT POSITION AND RETURNING TO INITIAL POSITION

EXAMPLE OF STANDARD REFERENCE  
EN 1111 cap. 10.6  
NF 077 cap. 10.6

CODE: ESL01 SINGLE LEVER MIXER ENDURANCE TEST

sw: AQ2TB-LM-ENCSA

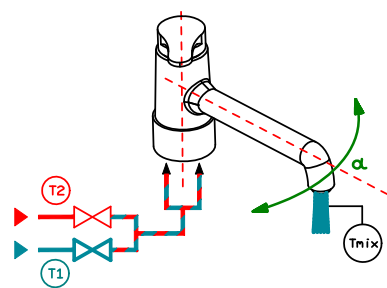
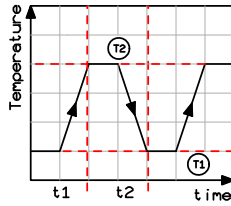
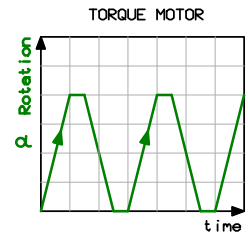


CONTROL AND ACQUISITION OF:  
- LINEAR SPEED  
- FORCE  
- ANGULAR SPEED  
- TORQUE  
- MIXED WATER TEMPERATURE

EXAMPLE OF STANDARD REFERENCE  
EN 817 cap. 12.1  
NF D18-214  
ASME A112.18.1-2005/  
CSA B125.1-05 cap. 5.6.3

CODE: ESS01 SWIVEL SPOUT ENDURANCE TEST

sw: AQ2TB-LBM-ENCSA

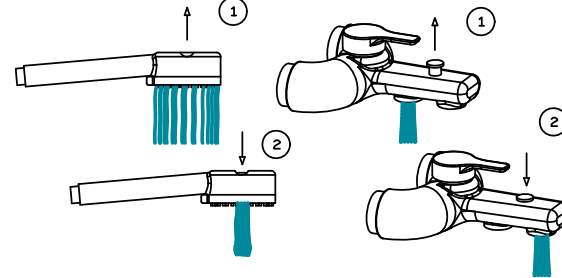
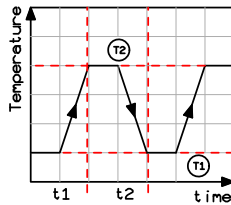
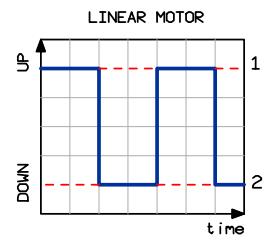


CONTROL AND ACQUISITION OF:  
- ANGULAR SPEED  
- TORQUE  
- WATER SUPPLY TEMPERATURE

EXAMPLE OF STANDARD REFERENCE  
EN 817 cap. 12.3  
NF D18-214  
ASME A112.18.1-2005/  
CSA B125.1-05 cap. 5.6.4

CODE: ED01 DIVERTER ENDURANCE TEST

sw: AQ2TB-LD-ENCSA

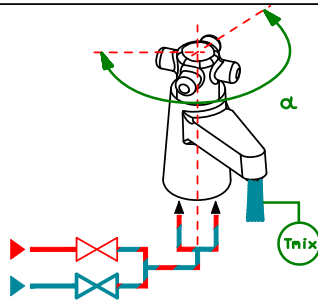
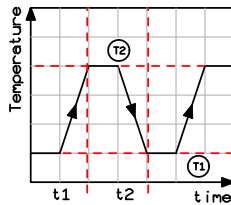
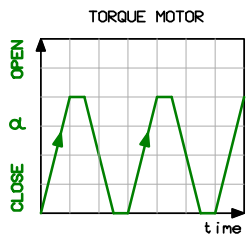


CONTROL AND ACQUISITION OF:  
- LINEAR SPEED  
- FORCE  
- FLOW VARIATION

EXAMPLE OF STANDARD REFERENCE  
EN 200 cap. 12.2  
EN 817 cap. 12.2  
EN 1111 cap. 12.3

CODE: EFC01 FLOW CONTROL ENDURANCE TEST

sw: AQ2TB-LR-ENCSA

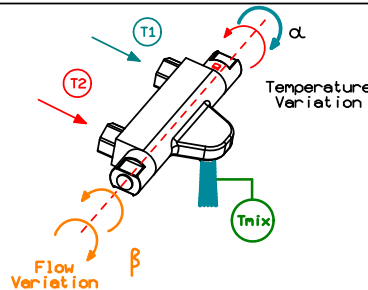
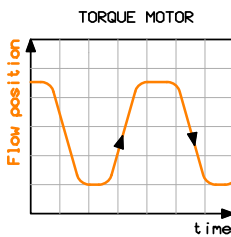
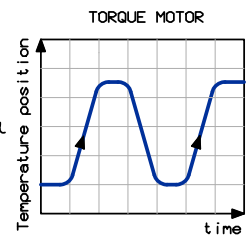


CONTROL AND ACQUISITION OF:  
- ANGULAR POSITION  
- TORQUE  
- WATER SUPPLY TEMPERATURE

EXAMPLE OF STANDARD REFERENCE  
EN200 cap. 12.1

CODE: ETM01 THERMOSTATIC MIXER ENDURANCE TEST

sw: AQ2TB-LRT-ENCSA

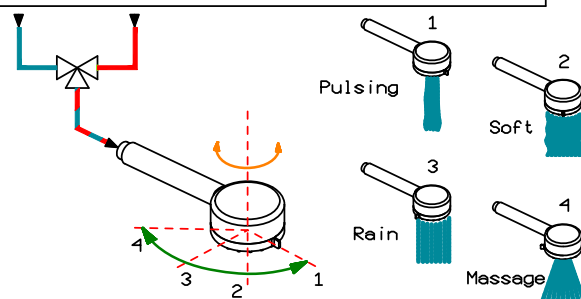
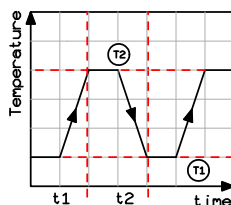
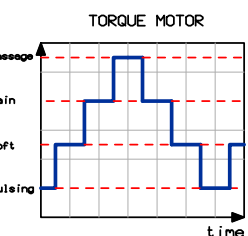


CONTROL AND ACQUISITION OF:  
- ANGULAR SPEED  
- TORQUE  
- MIXED WATER TEMPERATURE

EXAMPLE OF STANDARD REFERENCE  
EN 1111 cap. 12.2

CODE: ESM01 SHOWER MECHANISM ENDURANCE TEST

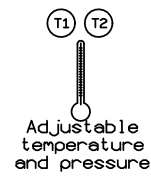
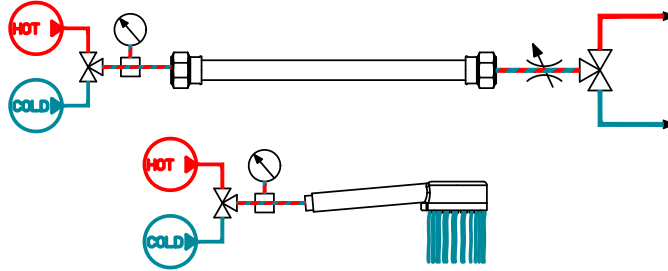
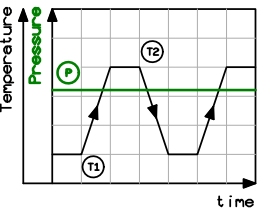
sw: AQ2TB-LSM-CSA



CONTROL AND ACQUISITION OF:  
- ANGULAR SPEED  
- TORQUE  
- MIXED WATER TEMPERATURE

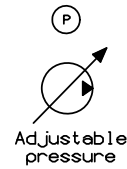
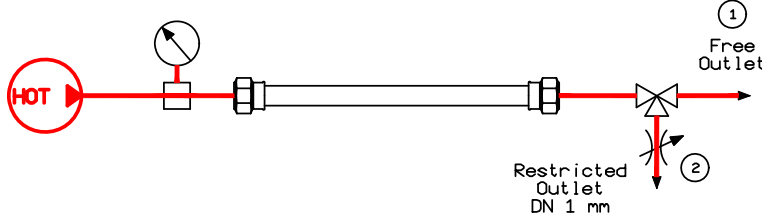
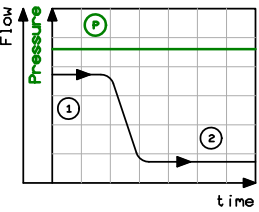
EXAMPLE OF STANDARD REFERENCE  
ASME A112.18.1-2005/  
CSA B125.1-05 cap. 5.6

CODE: TS01 THERMAL SHOCK TEST sw: AQ2TB-1LD-H&C



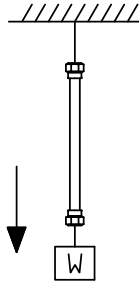
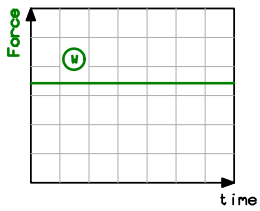
TEST RANGE  
PRESSURE: 1 - 3 bar  
TEMPERATURE: 20 - 70 °C  
FLOW: 2 - 80 L/min  
STANDARD REFERENCE  
EN 1112 cap. 10.3  
EN 1113 cap. 9.6

CODE: PRH01 PRESSURE RESISTANCE AT ELEVATED TEMPERATURE TEST sw: AQ2TB-LSH



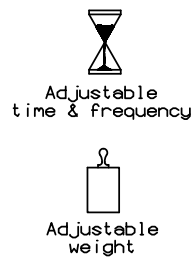
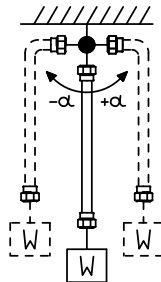
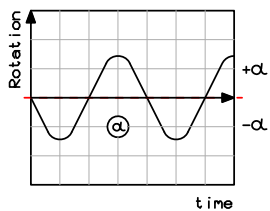
TEST RANGE  
PRESSURE: 1 - 3 bar  
TEMPERATURE: 70 °C  
FLOW: 1 - 6 L/min  
STANDARD REFERENCE  
EN 1113 cap. 9.4

CODE: TST01 TENSILE STRENGTH TEST without software



STANDARD REFERENCE  
EN 1113 cap. 9.2

CODE: RFL01 RESISTANCE TO FLEXING TEST without software



STANDARD REFERENCE  
EN 1113 cap. 9.3