

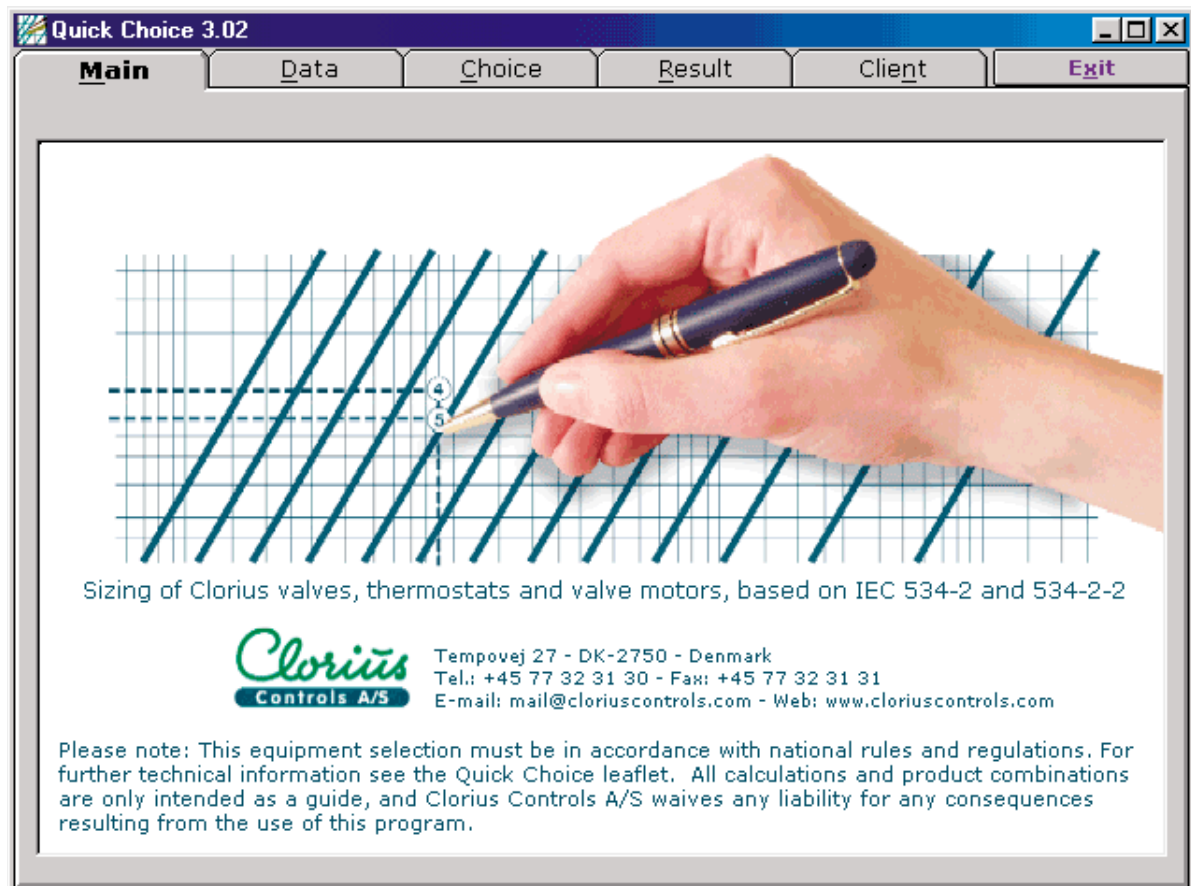
Quick Choice 3.02 Manual

Sizing of Valves and Actuators



Clorius
Controls A/S

- ensures reliable
control of heating, cooling
and ventilation systems.



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1. Important

Control equipment must always be in accordance with national rules and regulations. For further technical information, see the Quick Choice leaflet 9.0.00 in our catalogue.

All calculations and product combinations are only intended as a guide, and Clorius Controls waive any liability for any consequences resulting from the use of the Quick Choice programme.

2. General information

Quick Choice for Windows requires a computer with MS Windows 3.1, 3.11, MS Windows 95, MS Windows 98 or MS Windows NT.

The Quick Choice is easy to operate with mouse, but can also be operated with keyboard shortcuts.

A period (.) and not a comma (,) is used as a decimal separator.

3. How to install Quick Choice

Quick Choice can only be installed from MS Windows. Before starting the installation make sure that no other programs are running.

To install Quick Choice run "QuickChoice3.02.exe" from Windows.

Please read and follow the instructions. Setup may take a few minutes.

A program group window will be generated with the Quick Choice icon. To run the programme, double-click on the icon.

4. Scope of Quick Choice

The programme is designed to calculate the right valve size, when provided with flow data or power requirements. Each calculation option contains examples and illustrations.

5. Calculations based on flow

This option is used to size valves based on flow calculations.

To move from the main window to the data window, click on the Data tab in the top of the main window, and then select Water, Steam or Oil as valve media.

To find the right valve type and size, Quick Choice requires information on desired flow (G) and maximum allowed pressure drop (dpv) across the valve.

Temperature (T1) and inlet pressure (p1) are used to check the maximum allowed pressure and temperature for the valve in question.

The screenshot shows the 'Quick Choice 3.02' software window with the 'Data' tab selected. The 'Flow' section is active, and 'Water' is chosen as the valve medium. The input fields are as follows:

Parameter	Value	Unit
G (Volume flow)	12.5	m3/h
dpv (Pressure drop)	0.75	bar
T1 (Inlet temperature)	71	°C
p1 (Inlet pressure)	4.1	bar

Options section:

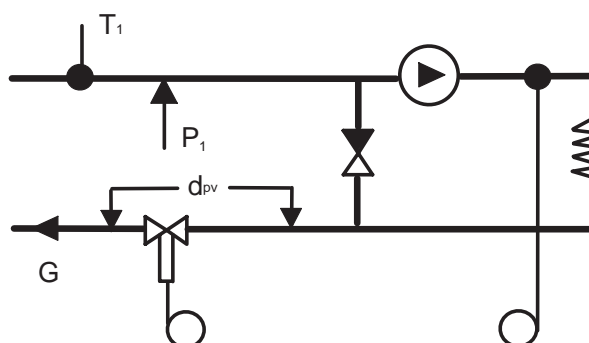
- Gunmetal
- Cast iron
- Nodular cast iron
- Cast steel
- Single seated
- Double seated
- Three ports
- Threaded ends
- Flanged ends
- Cooling

Buttons: Clear, Calculate

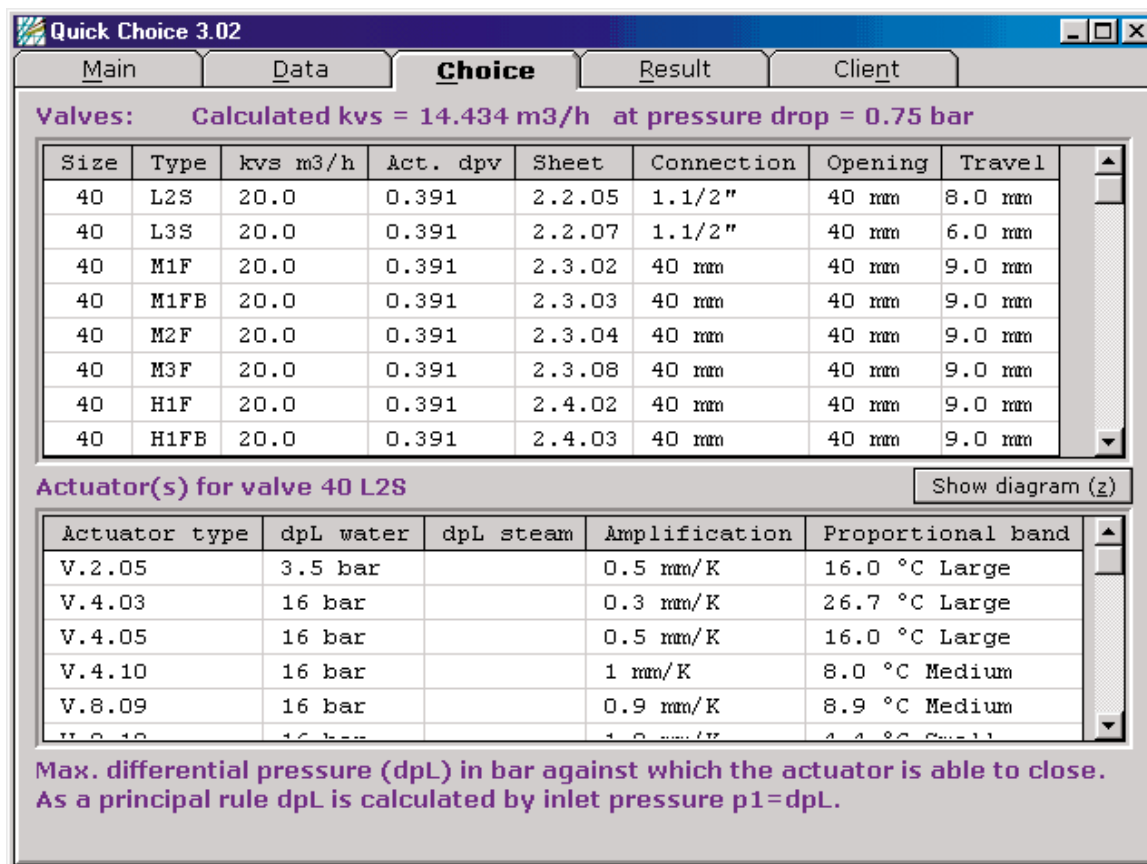
Footer: Inlet pressure: 1 bar < p1 < 40 bar

If units are to be changed, click the down-arrow button to the right of the Valve medium boxes. If necessary, deselect valve types or materials that are not desired, by clicking on the X'es under **Option**.

Fig. 1.



Click the **Calculate** button in the bottom right-hand corner.



Now two lists appear. The top list contains valves which are close to the design requirements. The bottom list contains possible thermostats, motors and pressure differential controllers which may be connected to the valve to which the cursor points in the top list.

Example:

Select 40 L2S as valve type and size on the top list.

As p1 is 4.1 bar, a thermostat with dpL = 16 is then selected.

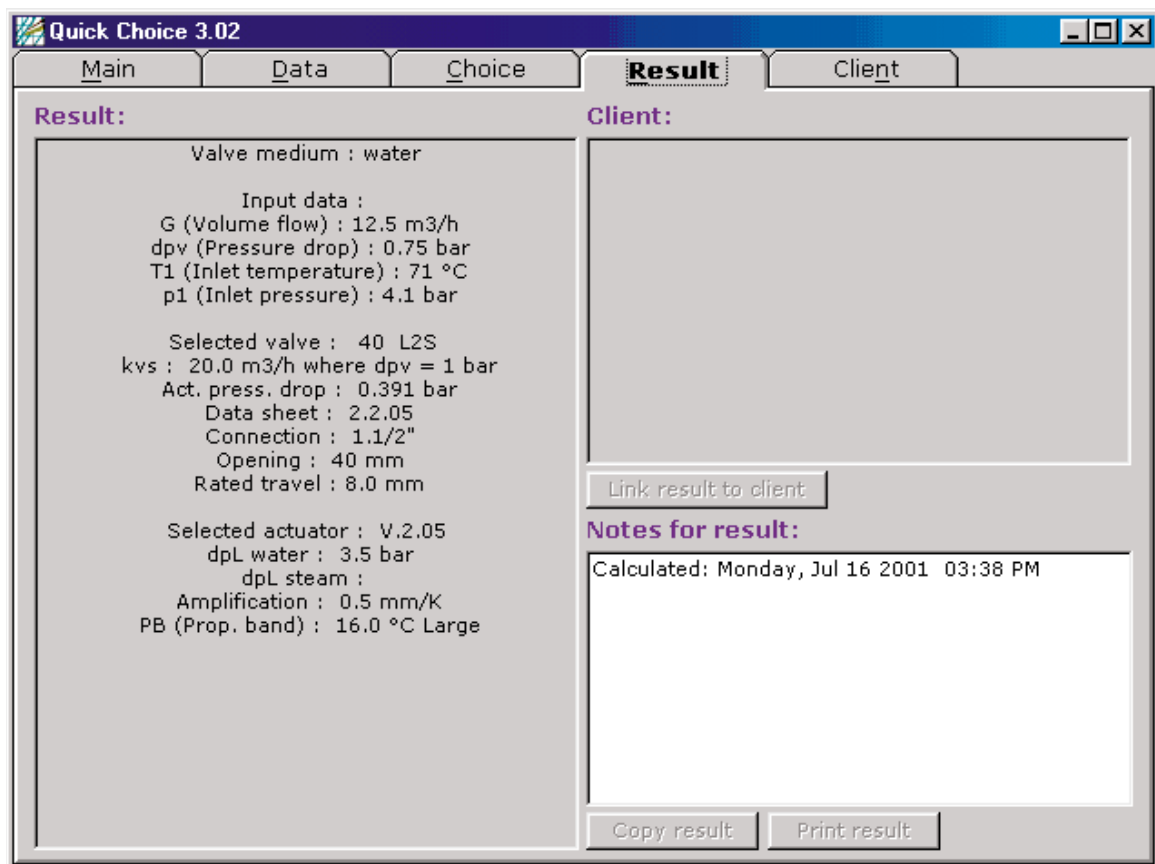
Select thermostat type V.4.05 on the bottom list.

Click the **Show diagram** button to make sure that the valve is within the limits for allowed pressure and temperature. Return to the previous window by clicking the **OK** button.

To make a new calculation, click on the **Data** tab, and then click the red **Clear** button.

At the bottom of the window, maximum allowed input value is shown in blue colour.

Click on the **Result** tab.



The result of the calculation now appears in the Result window.

To move the result to a word processing programme, click the **Copy result** button.

To make a hardcopy of the result, click the **Print result** button.

To link the result to a client, please see chapter 11 **Client database**.

6. Flow calculations based on heat requirements

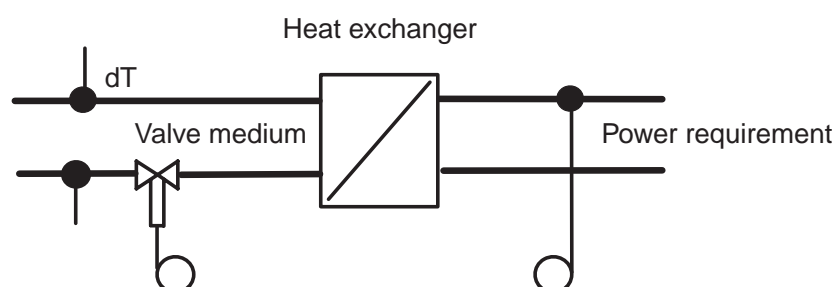
This function can be used to size control valves for heat exchangers. The calculations are based on ideal heat exchangers without heat losses and without considering heat transfer coefficients.

Click on the **Heat** and **Water** tab to make a calculation. To make a heat calculation, the necessary power consumption or flow data on the secondary side of the heat exchanger must be entered into the program.

The screenshot shows the 'Quick Choice 3.02' software window. It has a menu bar with 'Main', 'Data', 'Choice', 'Result', and 'Client'. Below the menu bar are tabs for 'Flow', 'Heat', and 'Clear'. Under the 'Heat' tab, there are sub-tabs for 'Water', 'Steam', and 'Oil'. The 'Water' sub-tab is selected. The interface is divided into two main sections: 'Power requirement' and 'Valve medium'.
 In the 'Power requirement' section:
 - P (Power) is set to 100, with a unit dropdown set to kW.
 - G (Flow) is empty, with a unit dropdown set to m3/h.
 - dT (Differential temperature) is empty, with a unit dropdown set to °C.
 - D (Density) is empty, with a unit dropdown set to kg/m3.
 - Cv (Specific heat) is empty, with a unit dropdown set to kJ/kgK.
 In the 'Valve medium' section:
 - dT (Differential temp) is set to 50, with a unit dropdown set to °C.
 At the bottom of the window, there is a button labeled 'Calculate flow (G) based on power requirement' and a status bar indicating 'Differential temp: 0 °C < dT < 180 °C'.

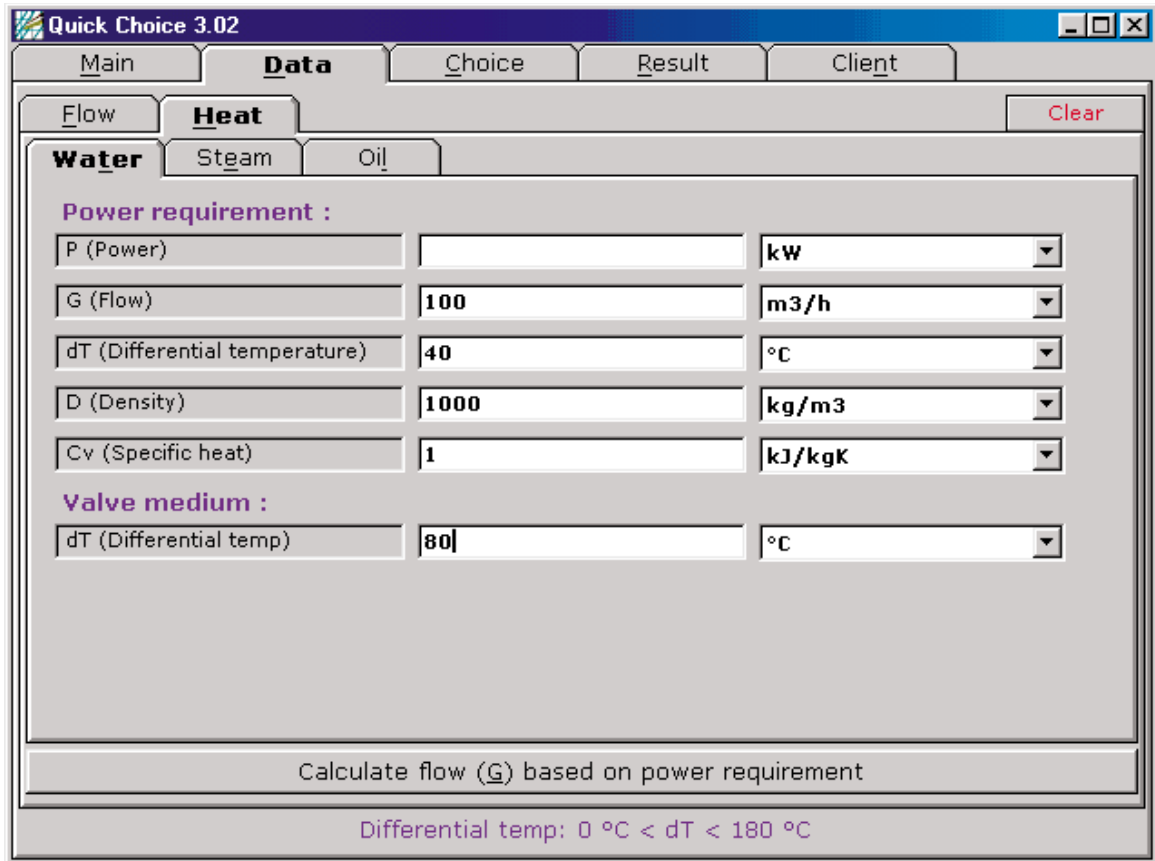
Click the **Calculate flow (G) based on power requirement** button at the bottom. Please see chapter 5 Calculations based on flow for further procedures.

Fig. 2.



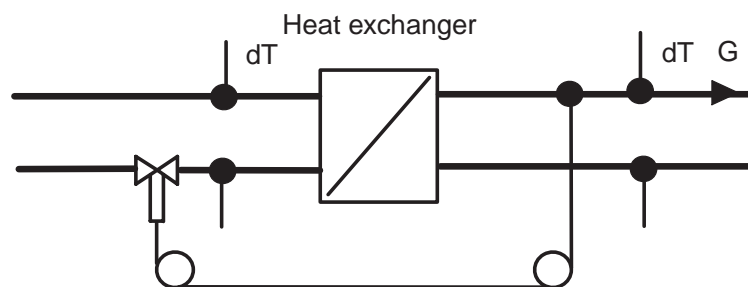
6.1. Flow calculations based on secondary flow data

Based on the flow data on the secondary side of the ideal heat exchanger, the Quick Choice can calculate the flow data on the primary side.



Click the **Calculate flow (G) based on power requirement** button at the bottom. Please see chapter 5 Calculations based on flow for further procedures.

Fig. 3.



7. Calculations based on steam flow

This function can be used to size steam control valves based on mass flow.

To move from the main window to the data window, click on the **Data** tab in the main window, and then click on the **Steam** tab.

To find the right valve type and size, Quick Choice requires information on desired steam flow (M), maximum inlet pressure (p1), inlet temperature (T1) and delta dpv/p1 (5).

If units are to be changed, click on the down-arrow button to the right of the Valve medium boxes.

The screenshot shows the 'Quick Choice 3.02' software window. The 'Data' tab is active, and the 'Steam' sub-tab is selected. The 'Valve medium' section contains the following inputs:

- M (Mass flow): 1.5 t/h
- dpv (Pressure drop): [empty]
- T1 (Inlet temperature): 179 °C
- p1 (Inlet pressure): 10 bar
- dpv/p1 (Delta): 0.42

Below the inputs are two radio button options:

- Select valves which fully fit the requirements
- Select valves which fully fit the requirements and select also valves which almost fulfill the requirements

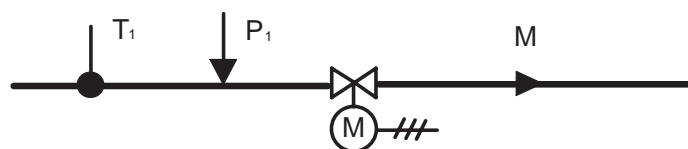
The 'Options' section includes the following checked items:

- Gunmetal
- Cast iron
- Nodular cast iron
- Cast steel
- Single seated
- Double seated
- Three ports
- Threaded ends
- Flanged ends

The 'Cooling' option is unchecked. A 'Calculate' button is located at the bottom right. At the bottom of the window, the text 'Delta: 0.01 < dpv/p1 < 0.42' is displayed.

If necessary, deselect valve types or materials that are not desired, by clicking on the X 'es in the **Option** box.

Fig. 4.



Quick Choice will always try to fulfil flow requirements, but if **Select valves which fully fit the requirements and select also valves which almost fulfill the requirements** is selected, Quick Choice will also suggest valves which almost fulfill the requirements but with reduced flow. The reduced flow is indicated in blue colour.

Click the **Calculate** button in the bottom right hand corner.

Quick Choice 3.02

Main Data **Choice** Result Client

Valves: Calculated kvs = 15.026 m3/h at pressure drop = 4.2 bar

Size	Type	kvs m3/h	Act. dpv	Sheet	Connection	Opening	Travel
40	M1F	20.0	1.417	2.3.02	40 mm	40 mm	9.0 mm
40	M1FB	20.0	1.417	2.3.03	40 mm	40 mm	9.0 mm
40	M2F	20.0	1.417	2.3.04	40 mm	40 mm	9.0 mm
40	H1F	20.0	1.417	2.4.02	40 mm	40 mm	9.0 mm
40	H1FB	20.0	1.417	2.4.03	40 mm	40 mm	9.0 mm
40	H2F	20.0	1.417	2.4.05	40 mm	40 mm	9.0 mm
40	G1F	20.0	1.417	2.5.02	40 mm	40 mm	9.0 mm
40	G1FB	20.0	1.417	2.5.03	40 mm	40 mm	9.0 mm

Actuator(s) for valve 40 M1F, Max. flow with sat. steam=2.043 t/h Show diagram (z)

Actuator type	dpL water	dpL steam	Amplification	Proportional band
V.2.05			0.5 mm/K	18.0 °C Large
V.4.03		0.8 bar	0.3 mm/K	30.0 °C Large
V.4.05		0.8 bar	0.5 mm/K	18.0 °C Large
V.4.10		0.8 bar	1 mm/K	9.0 °C Medium
V.8.09		3.5 bar	0.9 mm/K	10.0 °C Medium

Max. differential pressure (dpL) in bar against which the actuator is able to close.
As a principal rule dpL is calculated by inlet pressure p1=dpL.

Please see chapter 5 Calculations based on flow for further procedures.

8. Steam flow calculations based on heat

The calculations are based on ideal heat exchangers without heat losses and with no consideration to heat transfer coefficients.

Click on the **Heat** and **Steam** tab to make a calculation.

To make a heat calculation, the necessary power consumption or flow data on the secondary side of the exchanger must be entered into the program.

Quick Choice 3.02

Main **Data** Choice Result Client

Flow **Heat** Clear

Water **Steam** Oil

Power requirement :

P (Power) 100 kW

G (Flow) m3/h

dT (Differential temperature) °C

D (Density) kg/m3

Cv (Specific heat) kJ/kgK

Valve medium :

T1 (Inlet temperature) 179 °C

T (Saturated temperature) °C

To (Condensing temperature) 80 °C

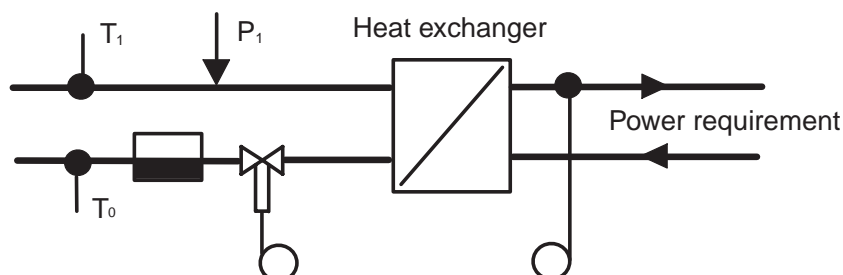
p1 (Absolute inlet pressure) 10 bar

Calculate flow (G) based on power requirement

Absolute inlet pressure: 1 bar < p1 < 40 bar

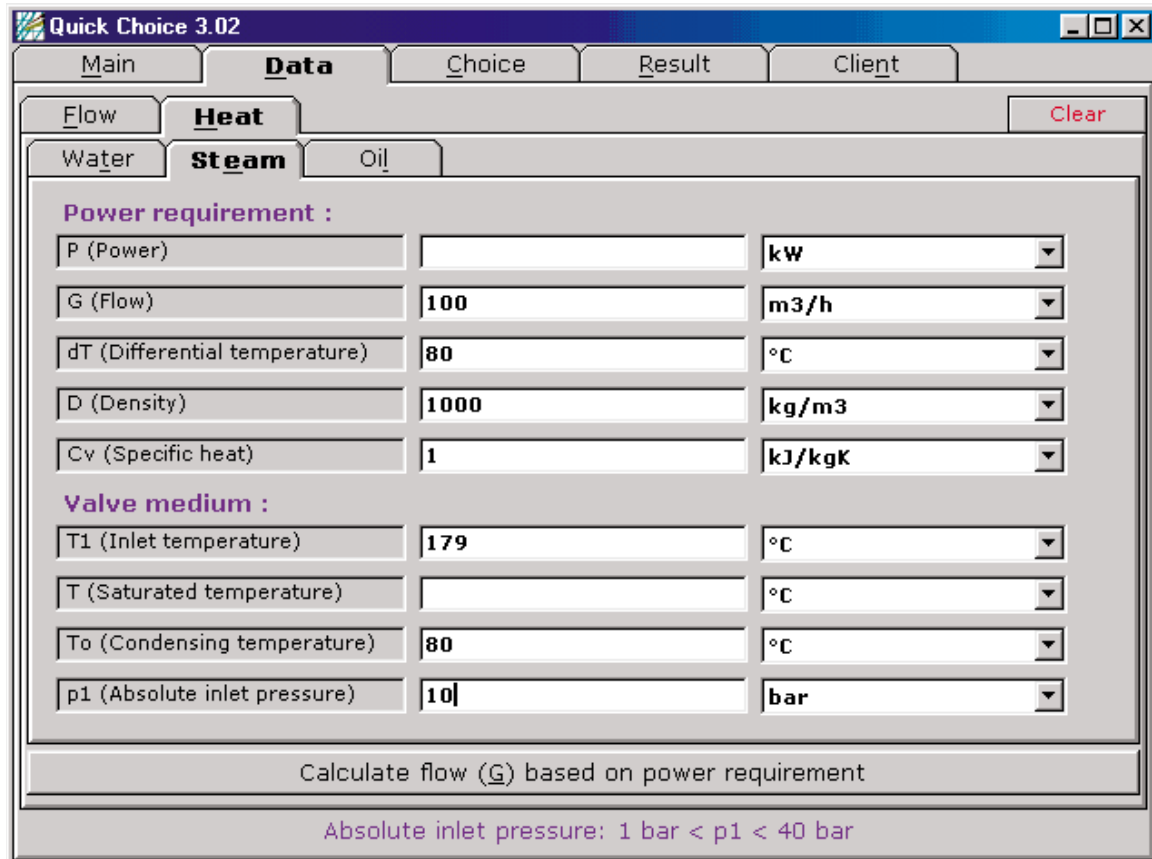
Click the **Calculate flow (G) based on power requirement** button at the bottom. Please see chapter 5 Calculations based on flow for further procedures

Fig. 5.



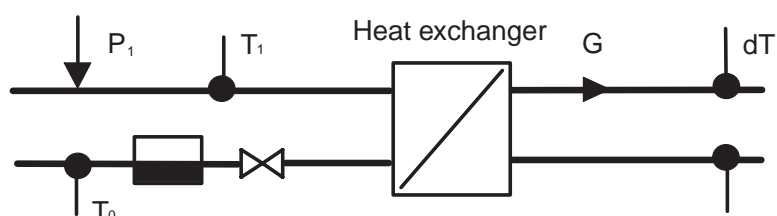
8.1. Steam flow calculations based on secondary flow data

If provided with the flow data on the secondary side of an ideal heat exchanger, Quick Choice can calculate the flow data on the primary side.



Click the **Calculate flow (G) based on power requirement** button at the bottom. Please see chapter 7 Calculations based on steam flow for further procedures.

Fig. 6.



9. Calculations based on oil flow

This function can be used to size control valves based on oil flow. To move from the main window to the data window, click on the **Data** tab in the main window, and then click **Flow** and **Oil**.

To find the right valve type and size, Quick Choice requires information on desired oil flow (G), maximum allowed pressure drop across the valve (dpv), viscosity (vk) and density (D) of the oil. Temperature (T1) and inlet pressure (p1) are used to check the maximum allowed pressure and temperature for the valve in question.

Quick Choice 3.02

Main | **Data** | Choice | Result | Client

Flow | Heat | Clear

Water | Steam | **Oil**

Valve medium :

G (Volume flow)	5.5	m ³ /h
dpv (Pressure drop)	0.81	bar
T1 (Inlet temperature)	105	°C
p1 (Inlet pressure)	5.0	bar
vk (Viscosity)	600	cSt
D (Density)	861	kg/m ³

Options:

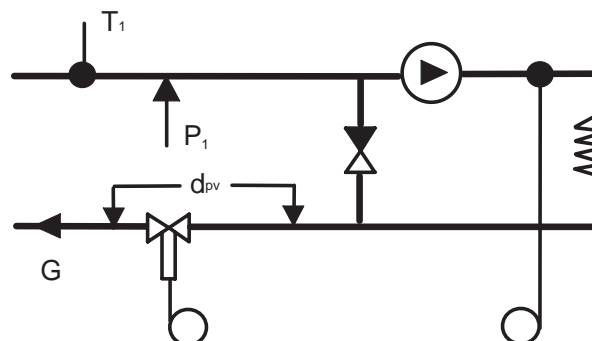
- Gunmetal
- Cast iron
- Nodular cast iron
- Cast steel
- Single seated
- Double seated
- Three ports
- Threaded ends
- Flanged ends
- Cooling

Calculate

Density: 0.1 kg/m³ < D < 3500 kg/m³

Please see chapter 5 Calculations based on flow for further procedures.

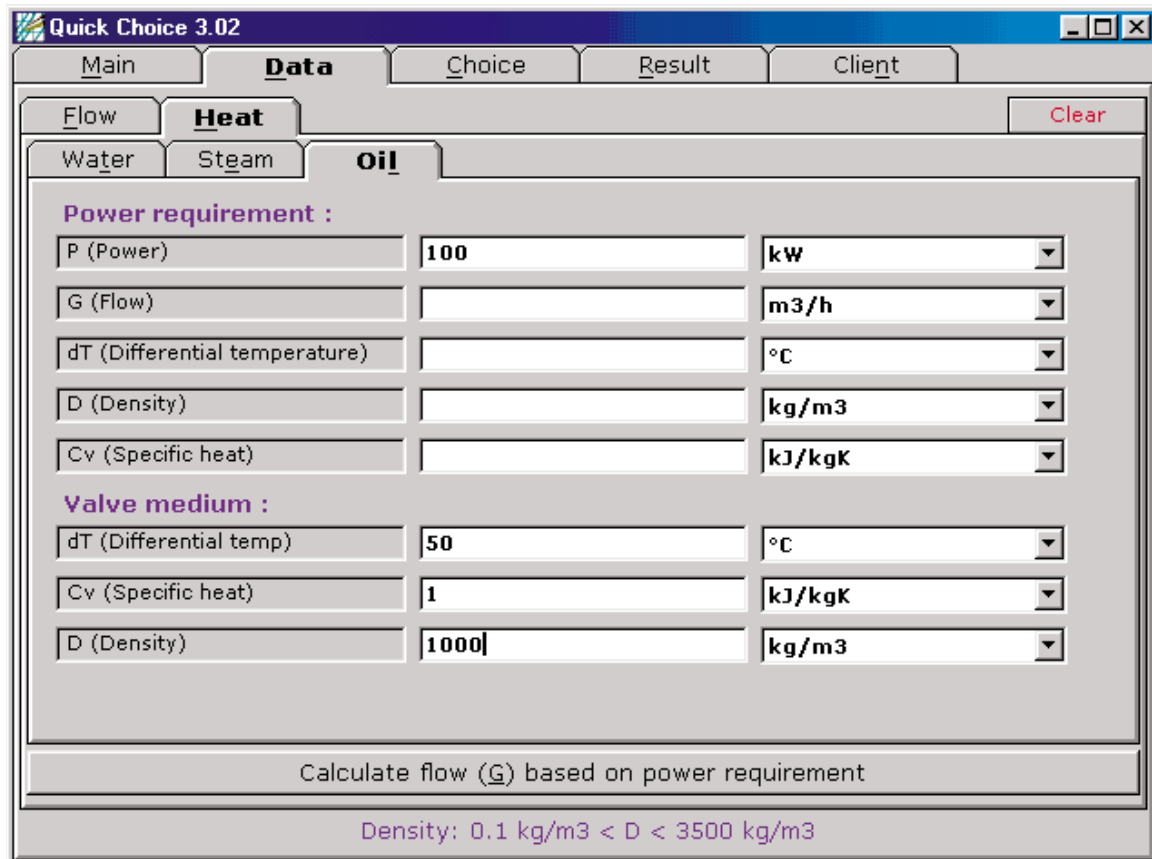
Fig. 7.



10. Oil flow calculations based on heat

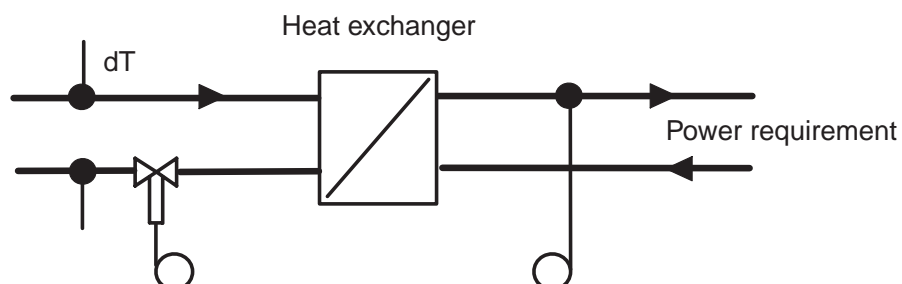
The calculations are based on ideal heat exchangers without heat losses and with no consideration to heat transfer coefficients.

Click on the **Heat** and **Oil** tab to calculate optional valve type and size. To make a heat calculation, necessary power consumption or flow data on the secondary side of the heat exchanger and flow data on the primary side must be entered into the program.



Click the **Calculate flow (G) based on power requirement** button at the bottom. Please see chapter 5 Calculations based on flow for further procedures.

Fig. 8.



10.1. Oil flow calculations based on secondary flow data

If provided with the flow data on the secondary side of an ideal heat exchanger, Quick Choice can calculate the flow data on the primary side.

Click the **Calculate flow (G) based on power requirement** button at the bottom.

Quick Choice 3.02

Main | **Data** | Choice | Result | Client

Flow | **Heat** | Clear

Water | Steam | **Oil**

Power requirement :

P (Power)		kw
G (Flow)	100	m3/h
dT (Differential temperature)	60	°C
D (Density)	1000	kg/m3
Cv (Specific heat)	1.0	kJ/kgK

Valve medium :

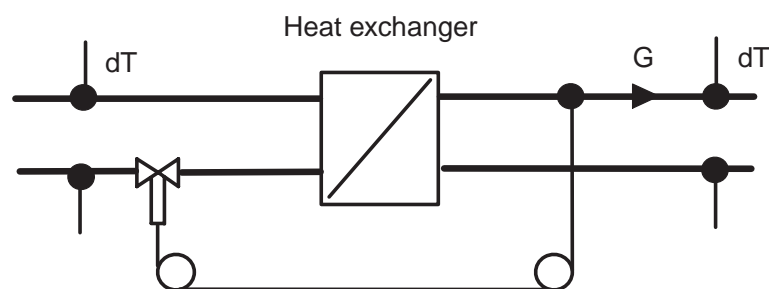
dT (Differential temp)	70	°C
Cv (Specific heat)	0.8	kJ/kgK
D (Density)	861	kg/m3

Calculate flow (G) based on power requirement

Density: 0.1 kg/m3 < D < 3500 kg/m3

Please see chapter 5 Calculations based on flow for further procedures.

Fig. 9.



11. Client database

Quick Choice contains a client database where all valve calculations can be saved under the name and address of the customer.

How to link a result to a client

First make a valve calculation, see **Calculation based on Water flow**.

Click the **Client** button and select a client.

Click on the **Result** tab, and then click link result to client.

Click the Client button, and then click **Load link**.

Now the result is linked to the client

Vocabulary for Client database

Add now: Creates and saves address card of a client in database.

Delete tilts: Deletes selected client card from database.

Update this: Replaces selected client card with modified one.

Find client: Finds client card with the typed text. For example "Cl" to find Clorius.

Find previous: Find the previous client card in the database.

Find next: Find the next client card in the database.

Copy client: Copy the client card to the clipboard.

Print client: Make a hardcopy of the client card.

Load Inks: Load the link result from the client card.

Previous link: Load the previous link result from the client card.

Next link: Load the next link result from the client card.

Delete link: Delete the link result from the client card.

Copy link: Copy the result to the clipboard.

Print link: Make a hardcopy of the result.



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