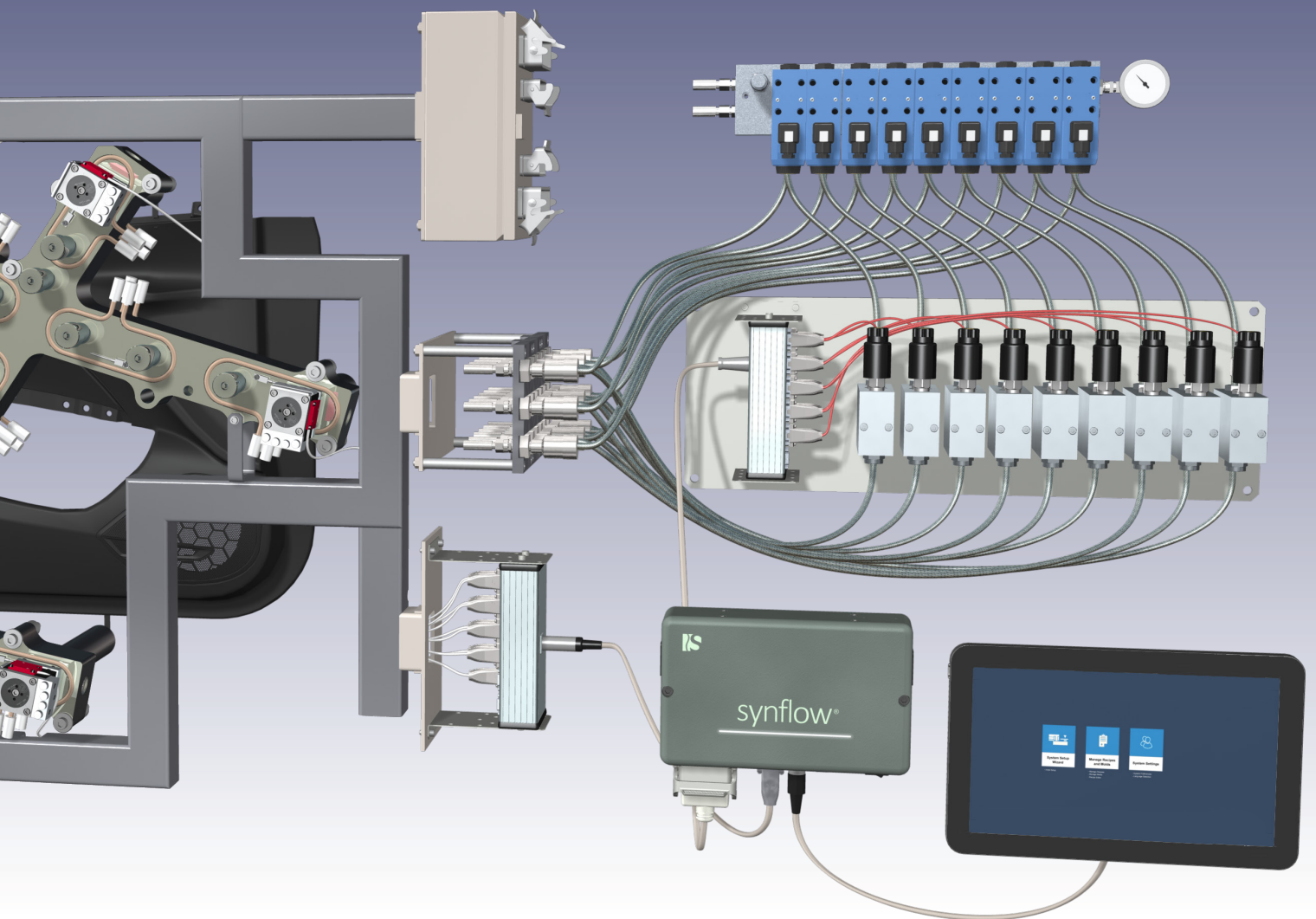


# synflow® Product Catalog

Valve Pin Opening & Intermediate Position Control



Elevate your process

CAT-16-0036\_EN-Rev09 (EN) 09 / 2022



## Valve Pin Opening &amp; Intermediate Position Control

**Product Type**

Equipment enables valve pin opening velocity and intermediate pin holding control for hydraulic valve gate hot runner systems up to 24-zones. Contact Synventive for applications greater than 24-Zones.

**1. Valve Gate Hot Runner System**

Hydraulic valve gate hot runner system with conical valve gate.

- a) Hydraulic actuator with position sensor
- b) For use on all E-Series and XP-Series nozzles.

**Note:** synflow® is available with the HB2508, HB4016, and QCVG16M06 hydraulic actuators. Reference the Actuator Catalogue for more information.

**2. synflow® Flow Control**

- c) Position Junction Box
- d) Drive Junction Box
- e) Valve Assemblies (eFRV)
- f) Controller
- g) Tablet

**Operation Principle, Application, Benefits**

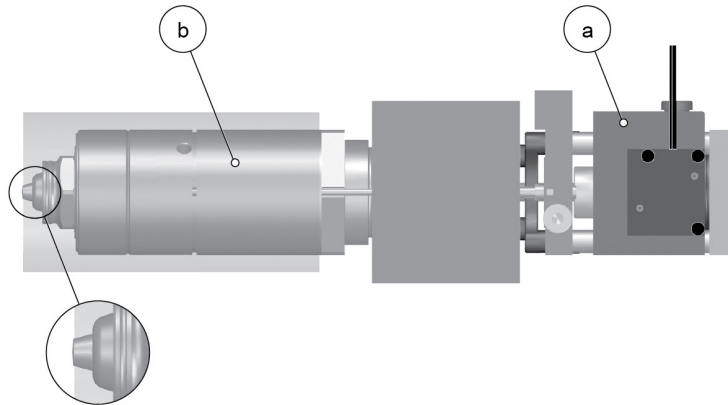
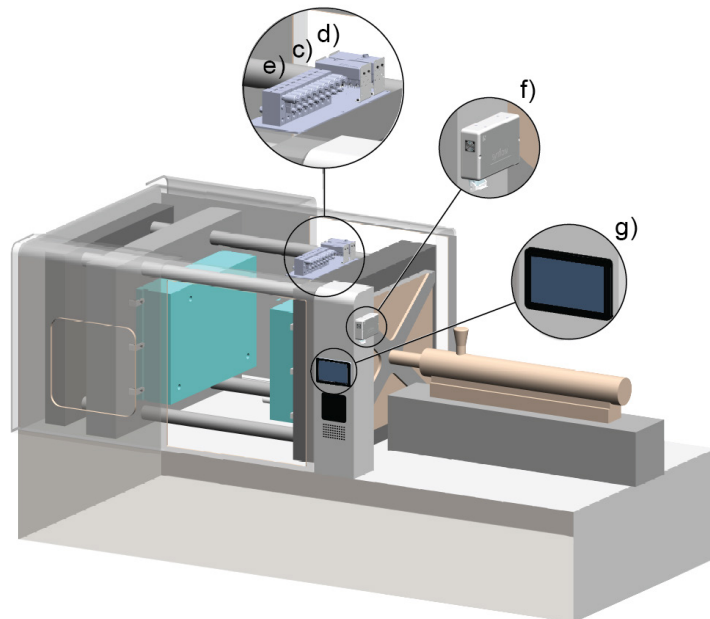
- ◆ User-defined valve pin opening velocity for a user-defined distance
- ◆ User-defined valve pin opening intermediate position
- ◆ Up to two different user defined pin opening profiles per nozzle for each injection molding cycle

**Note:** Valve Pin Sequencing is controlled by Customer's Sequential Valve Gate Controller.

**Areas of Application**

- ◆ Optimized surface quality of sequentially or cascade injection molded parts
- ◆ Improved dimensional control on injection molded parts
- ◆ Improved cavity-to-cavity balance
- ◆ Reduce cavity pack pressures
- ◆ Pre-fill cold runners

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

**1** Valve Gate Hot Runner System with conical valve gate pin**2**

Configuration B shown for reference only



Overview Hydraulic Configuration A / B / C

Plug 'n Play® Systems

Components and wiring connections are installed on the hot runner system and are delivered pre-wired and pre-tested.

Configuration A

Configuration A refers to systems with individual open and close fittings plumbed directly to each actuator. Systems are controlled by a directional valve stack either on the molding machine or on a stand-alone hydraulic power unit.

Option: synflow can be added either as a cart or plate option.

Configuration B

Configuration B refers to systems with individual open and close fittings plumbed to each actuator through either a synflow InLine eFRV's or a dummy block depending on whether the system is synflow or VMI. Systems of this configuration are controlled by a directional valve stack either on the molding machine or on a stand-alone hydraulic power unit.

Option: If adding synflow in the field, replace preplumbed dummy blocks with In-Line eFRV's. If over 12 zones eFRV JB needs to be added.

Configuration C

Configuration C refers to systems with a directional valve stack on the tool or hot runner and just two hydraulic fittings for the mold (pressure and return to tank).

Option: If adding synflow in the field, install sandwich eFRV's between solenoid valves and hydraulic manifold, add eFRV junction box.

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

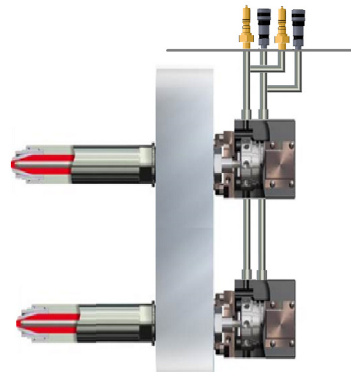
The Electronic Flow Restrictor Valves (eFRV's) used by synflow must be plumbed on the "close" line between the directional valves and the actuators.

Molders may use directional valves on the injection molding machine or on a stand-alone hydraulic power unit. In this situation two hydraulic connections must be made to the mold for each actuator, one for "open" and one for "close".

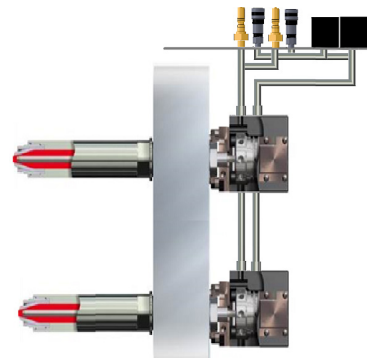
Molders may also use directional valves that are pre-plumbed to the hot runner system. In this situation there are only two hydraulic connections to the mold, one for "pressure" and one for "return to tank".

These different hydraulic configurations impact both the hot runner design of a synflow system as well as the controller options for running the mold as synflow.

A

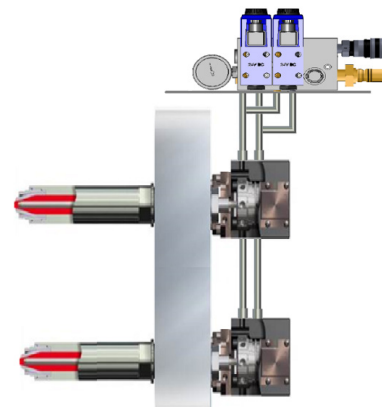


B



synflow systems are supplied plumbed with eFRV's. Systems can also be supplied with dummy blocks which match the size of eFRV's. This facilitates future upgrades without the need to re-plumb the system.

C





Configuration A - Plate with Controller Option

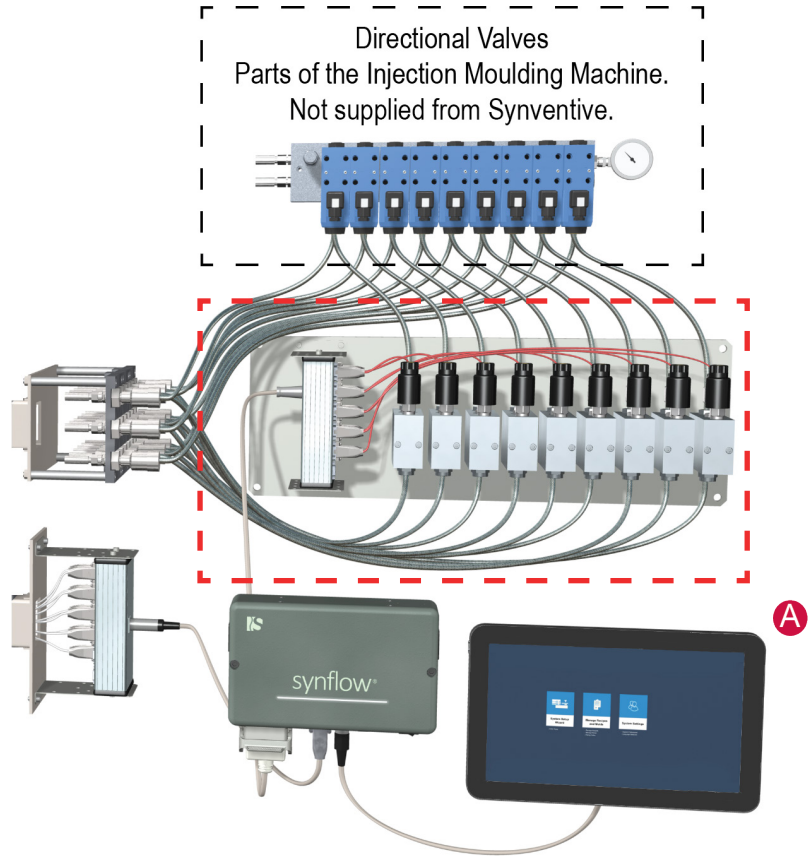
Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

FRV & Driver box SF3-24Z DRV BOX

(A) Inline Valve Plate Kit's

Item Number	Qty:	IN-LINE eFRV
SF3-IVPK-01	1	
SF3-IVPK-02	2	
SF3-IVPK-03	3	
SF3-IVPK-04	4	
SF3-IVPK-05	5	
SF3-IVPK-06	6	
SF3-IVPK-07	7	
SF3-IVPK-08	8	
SF3-IVPK-09	9	
SF3-IVPK-10	10	
SF3-IVPK-11	11	
SF3-IVPK-12	12	
SF3-IVPK-13	13	
SF3-IVPK-14	14	
SF3-IVPK-15	15	
SF3-IVPK-16	16	
SF3-IVPK-17	17	
SF3-IVPK-18	18	
SF3-IVPK-19	19	
SF3-IVPK-20	20	
SF3-IVPK-21	21	
SF3-IVPK-22	22	
SF3-IVPK-23	23	
SF3-IVPK-24	24	

Hydraulic lines or fittings not supplied.





Configuration A - Cart Option

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

**Product Description**

Mobile PID control unit with max. 24 control zones which enables valve pin opening velocity and intermediate pin holding control for hydraulic valve gate hot runner systems.

The control unit is delivered including all connection cables with a standard length of 7,5 m.

The control unit is operated by a touch screen which can be mounted in different ways.

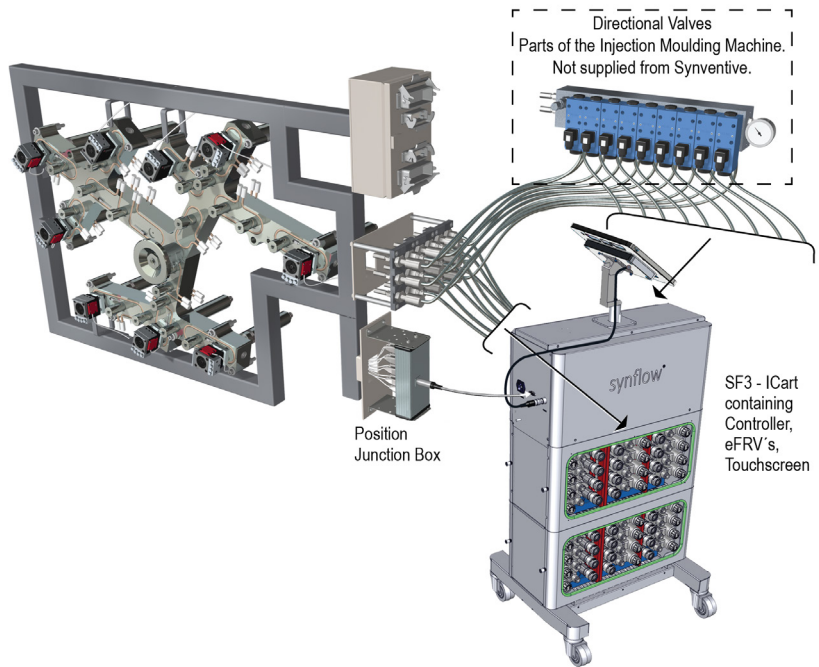
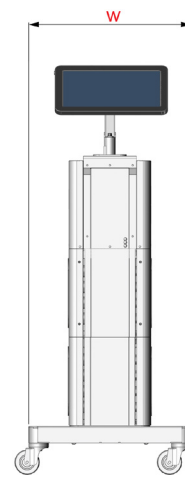
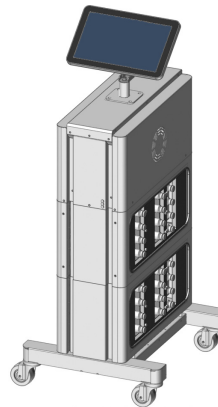
**Technical Data**

Current	1/PE 110 / 230 V AC 50 / 60 Hz 3 A max.
Temperature	5 ... 40 °C
Humidity	0...80% non condensing

**Dimensions**

**h x w x d** 1145 x 600 x 550 mm

Item Number	Qty.: IN-LINE eFRV
SF3-ICART-01	1
SF3-ICART-02	2
SF3-ICART-03	3
SF3-ICART-04	4
SF3-ICART-05	5
SF3-ICART-06	6
SF3-ICART-07	7





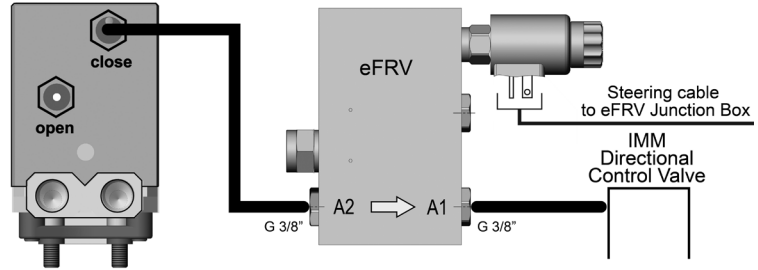
Configuration B - synflow® Control Valve, "In-Line Version" SF100-5000-01-01#

SF3-ICART-08	8
SF3-ICART-09	9
SF3-ICART-10	10
SF3-ICART-11	11
SF3-ICART-12	12
SF3-ICART-13	13
SF3-ICART-14	14
SF3-ICART-15	15
SF3-ICART-16	16
SF3-ICART-17	17
SF3-ICART-18	18
SF3-ICART-19	19
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SF3-ICART-23	23
SF3-ICART-24	24

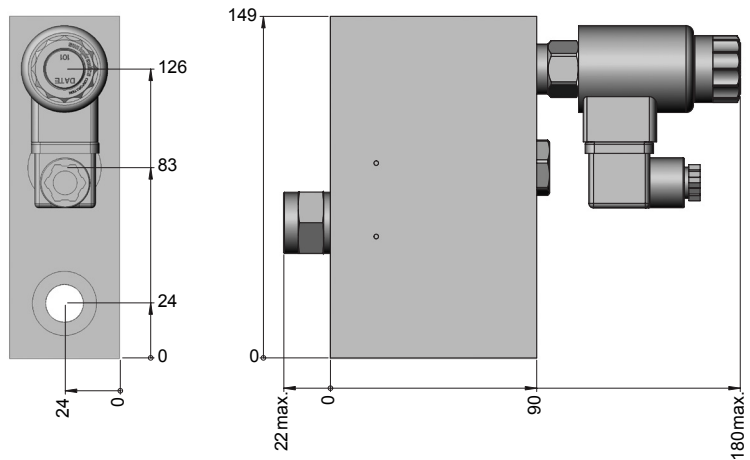
Control unit SF3-ICART comes complete with controller, touchscreen and eFRV's. Hydraulic lines or fittings not supplied.

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

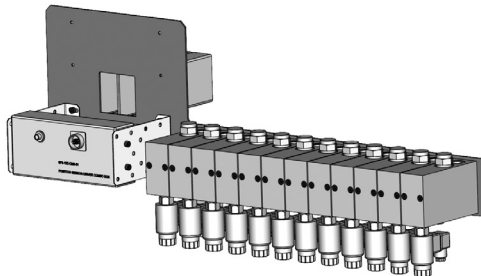
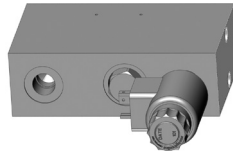
Connection



Dimensions



eFRV Control valve







Configuration C - synflow® Control Valve, "Sandwich Version" SF3-SV01#

**eFRV Control valve SF100-5000-01-01**

**Product Description**

Electronically controlled flow control valve - "In-Line Version" for controlling valve pin opening velocity and intermediate position.

The control valve is be mounted in line to the hydraulic pipe.

**Attention:**

The customer's cascade control is still required!

**Operating Data**

Operating Pressure	40 - 60 bar (70-100 bar, QCVG16 only)
Oil type	Hydraulic oil, HLP 32 DIN 51524-2
Connections for hoses or piping	A1, A2: G 3/8"

May be supplied as a synflow ready, in which case dummy block will be supplied as placeholders for the eFRV's to simplify any future upgrade.

**eFRV Kits**

- SF200-2000-IVK-01 with 2 m Cable
- SF200-2000-IVK-03 with 6 m Cable

**Components**

a) In-Line eFRV	SF100-5000-01-01
eFRV Cable 2 m	SF200-2000-JC-20-01
eFRV Cable 6 m	SF200-2000-JC-60-01



eFRV M6 Mounting Bolts (not shown)	DIN912-M6X150-12.9
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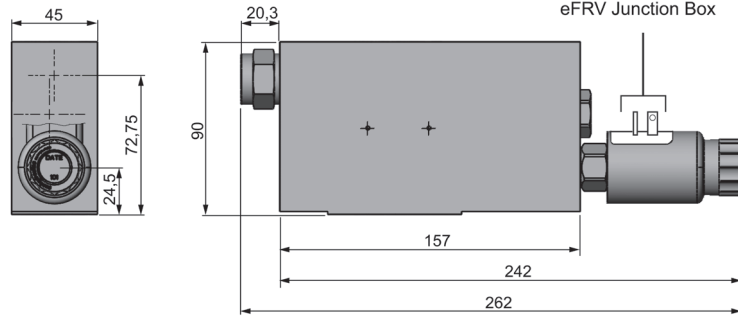
**Configuration**

**In-Line:** eFRV's & drive junction box mounted on the tool using customer supplied Injection Molding Machine's Directional Control Valves

**Note:** Synventive can supply the eFRV's to be mounted on the machine, eliminating recurring costs on additional tools. For specific applications, please contact Synventive.

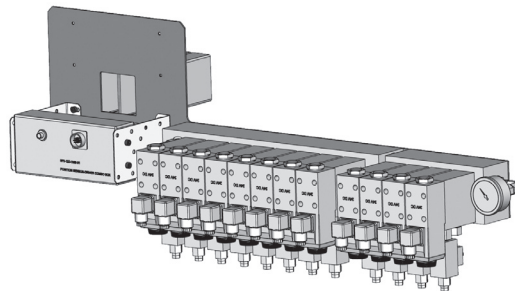
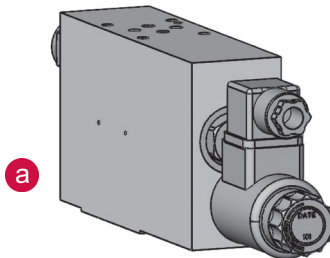
Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

**Dimensions**



Steering cable to eFRV Junction Box

**eFRV Control valve**





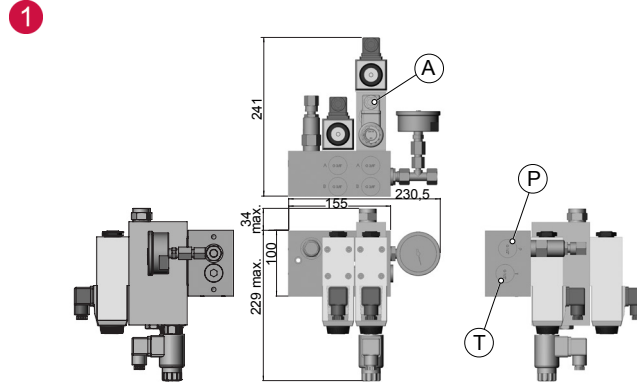
Configuration C - synflow® Control Valve, "Sandwich Version" SF200-2000-IVK-0#

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

Examples of eFRV, Sandwich style mounting:

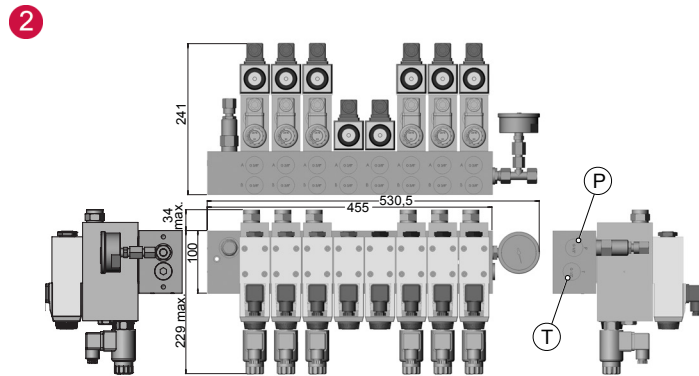
1. Example of a 2-fold valve block

with one synflow® control zone



2. Example of an 8-fold valve block

with six synflow® control zones



Operating Data

Operating Pressure	40 - 60 bar (70-100 bar, QCVG16 only)
Connections	P, T: G 1/2" A, B: G 3/8"
Oil type	Hydraulic oil, HLP 32 DIN 51524-2





## Configuration A / B / C - Position and Drive Junction Boxes

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

**Product Description**

Position and drive junction boxes are available in 12-zone and 24-zone configurations.

A 12-zone combo-box is also available as a compact solution when the valves are mounted on the tool or hotrunner.

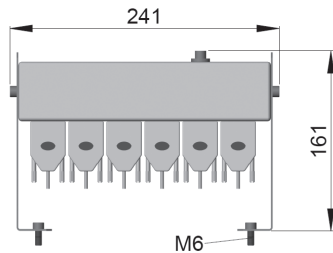
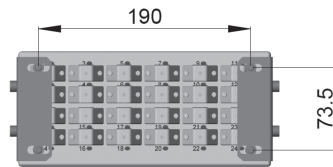
All junction boxes have the same form factor and mounting pattern.

Drive Junction Box  
Electronic Flow Restrictor Valve (eFRV) control

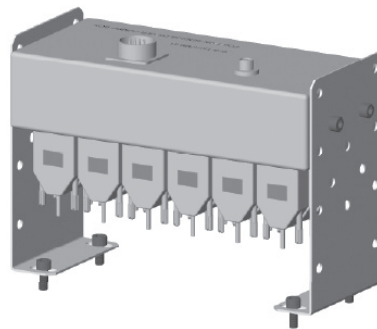
Position Junction Box  
Position sensor input and recipe storage

**Components**

- 1) 12 Zone Position JB  
SF3-12Z-JB-01
- 2) 24 Zone Position JB (shown)  
SF3-24Z-JB-01
- 3) 12 Zone Potentiometer JB (QCVG16M06 only)  
SF3-12Z-JB-02
- 4) 24 Zone Potentiometer JB (QCVG16M06 only)  
SF3-24Z-JB-02
- 5) 12 Zone Drive JB  
SF3-12Z-DRV-01
- 6) 24 Zone Drive JB  
SF3-24Z-DRV-01
- 7) 12 Zone Position & Drive Combo JB\* (shown)  
SF3-12Z-CMB-01
- 8) 12 Zone Potentiometer & Drive Combo JB SF3-12Z-CMB-02 (QCVG16M06 only)
- 9) Mounting Bracket (shown)  
VMI-16ZJBE-MB
- 10) M6 Socket Cap Screw DIN912 (shown)  
DIN912-M6x12-12.9

**6****7**

\* 12-Zone Position & Drive Combo Junction Box with Mounting Brackets and M6 Cap Screws shown below. Reference system BOM to determine actual part used on applicable system.





Configuration A (Plate Option) / B / C - Controller Kit: SF3-24Z-SCK-01

Controller for up to 24 zones.

Technical Data

Current	100 / 240 VAC 1 Phase / N / PE (+/- 10%) 50 / 60 Hz 1.0-5.0 A
Temperature	0 - 50 °C (32 - 122 °F)
Humidity	<95 % no condensate

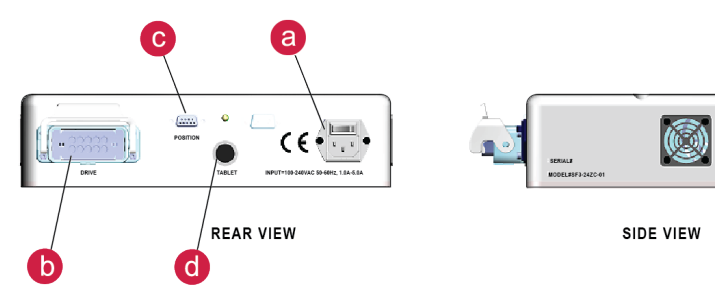
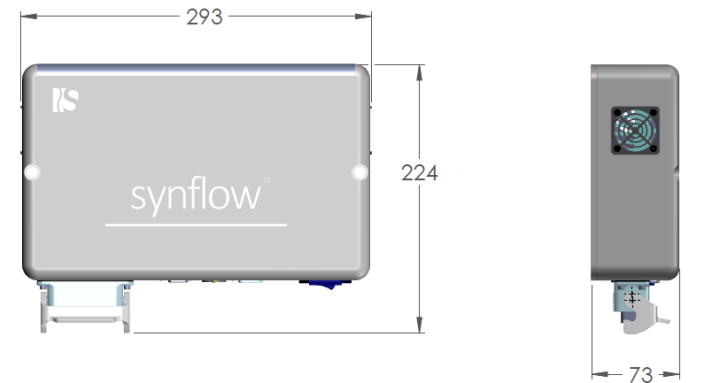
Components

- a) Controller SF3-24ZC-01
- b) AC Power Cord, EU IL13EU1H053100200
- c) AC Power Cord, US/CA IL13US1SVT3100183
- d) AC Power Cord, CN 6051.2030
- e) Socket Cap Screw DIN912 DIN912 -M8x75-12.9
- f) Metric Hex Nut M8x1.25 mm DIN934-M8x1.25-SS
- g) M8 Washer DIN125x89

Connections

- a) Main Power
- b) Drive Box
- c) Position Signal
- d) Tablet

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.





Configuration A (Plate Option) / B / C - Cable Kit: SF3-CBK-70-01 & Tablet Kit: SF3-SDK-02

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

**Cable Kit, 7.5 m (length)**

SF3-CBK-70-01

**Components**

a) Drive Cable  
SF3-DRV-JC-01

b) Position Sensor Cable  
VMI-SC01-7000

**Tablet (Display) Kit**

SF3-SDK-02

**Components**

a) Tablet  
SF3-TBLT-03

b) Tablet Mount (Optional)

AG-TBLT-BASSY

**Note**

Used to mount tablet (display) to a flat ferrous surface

c) Tablet Cable  
SF3-UI-JC-02

**Note**

The Controller Kit, Cable Kit, and Tablet Kit are available under a single part number SF3-24ZK01

d) E405167  
VESA 75, Wall mount

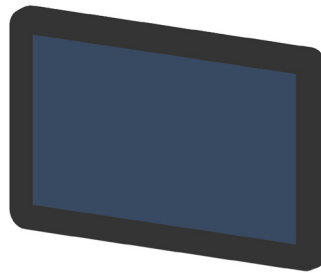
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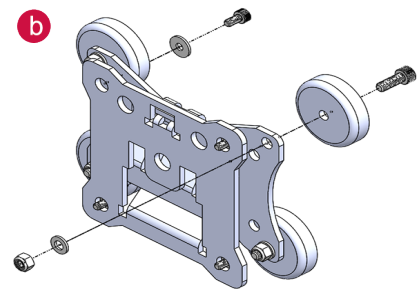
b



a



b

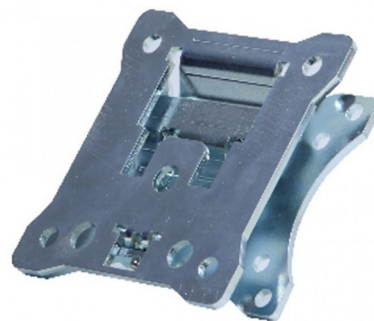


Tablet mount shown for reference only.  
Not included in Kit.

c



d





## Optional Injection Molding Machine I/O Mod

**Optional synflow IMM I/O Module (SF3-IMMCK01)**

The optional synflow IMM Interface connects to the synflow controller in order to provide signals that can be used to inhibit injection for cases when the Controller:

- ◆ Is Set to Idle (in order to prevent molding bad parts)
- ◆ Cycle is not complete:
  - Pins do not fully open during a cycle
  - Pins do not fully close upon completing a cycle

Also provides signal that can be used by the IMM to warn operator when any pin is in open state before entering safety gate.

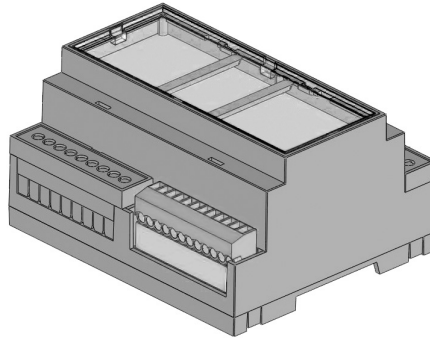
The SF3-IMMCK01 (IMM Connector Kit) includes:

- 1) SF3 IMM Relay Box
- 2) Cable, DB9 M/M Molded 7,5 m (25 Ft)

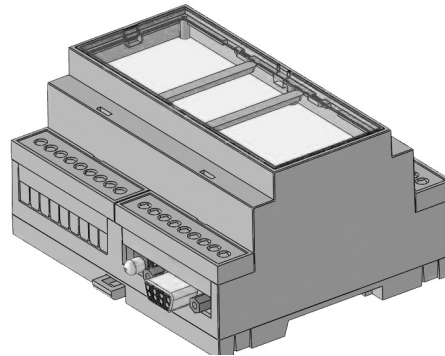
Applicable wiring instructions are available on the Synventive website.

Illustrations simplified, schematically drawn and not to scale. All dimensions in mm.

1 SF-3-IMMCK01  
Front Side View



Back Side View



2 Cable, DB9 M/M Molded



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