

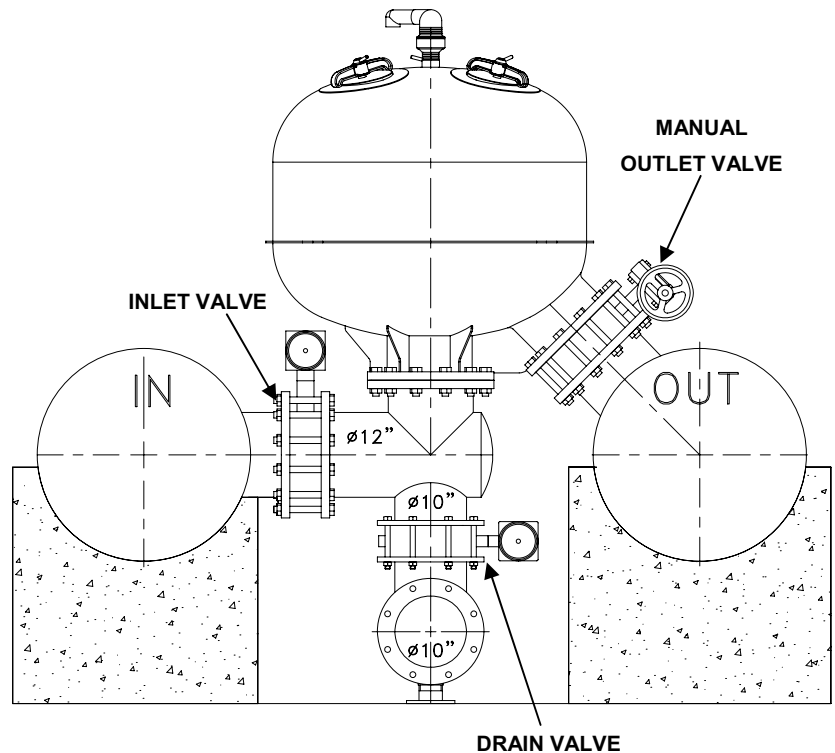
# Spin Klin 12" Super Flow

# Galaxy Super Flow Spin Klin® Battery Standard Automatic Backwash

## Operation and Maintenance Manual

### Filtration Process

During filtration, water flows from the inlet manifold, through the 12" inlet valve into the filter, and through the 12" manual outlet valve (which serves as an isolation valve only, when needed). Filtered water gathers in the outlet manifold and flows into the user system. Drain valve is close.



### Backwash Process

The backwash process is initiated by the control unit according to differential pressure between the inlet and outlet or by time sequence, set by the user.

The first solenoid transmits a command to filter no. 1's valves.

The Inlet valve shuts off and the drain valve opens.

Filter no. 1 is now in backwash mode.

The 51 Spin Klin spines in filter no. 1 operate simultaneously, releasing the compressed discs. Tangential jets of clean water are pumped at high pressure in the opposite direction through nozzles at the center of the spine. The discs spin free and clear, loosening the trapped solids. Solids are quickly and efficiently flushed out through the drain.

The filtered backwash water is supplied by the other filters through the outlet manifold.

The contaminated water from the backwashed filter drains through the drainage manifold.

Filters backwash will take 20-30 seconds (valve type and size effects the total flushing time). When the time elapses the control unit stops the backwash signal to the solenoid. The solenoid releases the command, allowing the valves and the discs of the 51 spines to return to filtration mode.

Once filter no. 1 is in the filtration position again, the control unit sends a command to begin the backwash process of filter no. 2.

## Spin Klin Technology- Spine Model 2

### General:

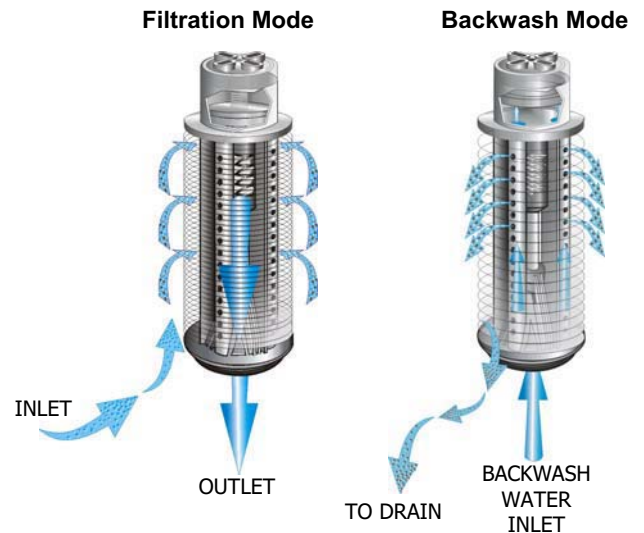
The Spin Klin discs are stacked on the Spin Klin spine. The discs are color-coded according to nominal micron size and are assembled according to your water filtration requirements. The spine assembly has a spring compression unit and an internal piston, which are used to alternately compress and release the discs during filtering and backwashing cycles.

### Filtration Mode:

During the filtration process the filtration discs are tightly compressed together by the spring and the differential pressure, thus forcing the water to flow through the "crisscross grooves" of the discs.

### Backwash Mode:

During backwash the discs are released hydraulically, simultaneously with the pressure release. Multi-jet nozzles provide tangential spray on the loosened discs, causing them to spin and flush out the retained solids to the drain.



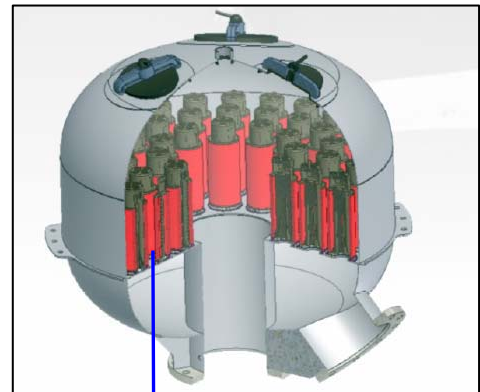
## Valves Operation

Each filter is equipped with 2 automatic valves (butterfly or other, according to the application's requirements) to switch between filtration and backwash mode. The 12" manual outlet valve serves as an isolation valve only, when needed.

**Filtration mode:** The inlet valve permits flow from the inlet manifold through the filter, into the system.

**Flushing mode:** The inlet valve closes and the drain valve opens, causing reverse flow through the filter, ejecting impurities via the drain manifold. Operation is initiated by an electric solenoid.

The valves are operated by means of pneumatic, hydraulic or electric source\*.



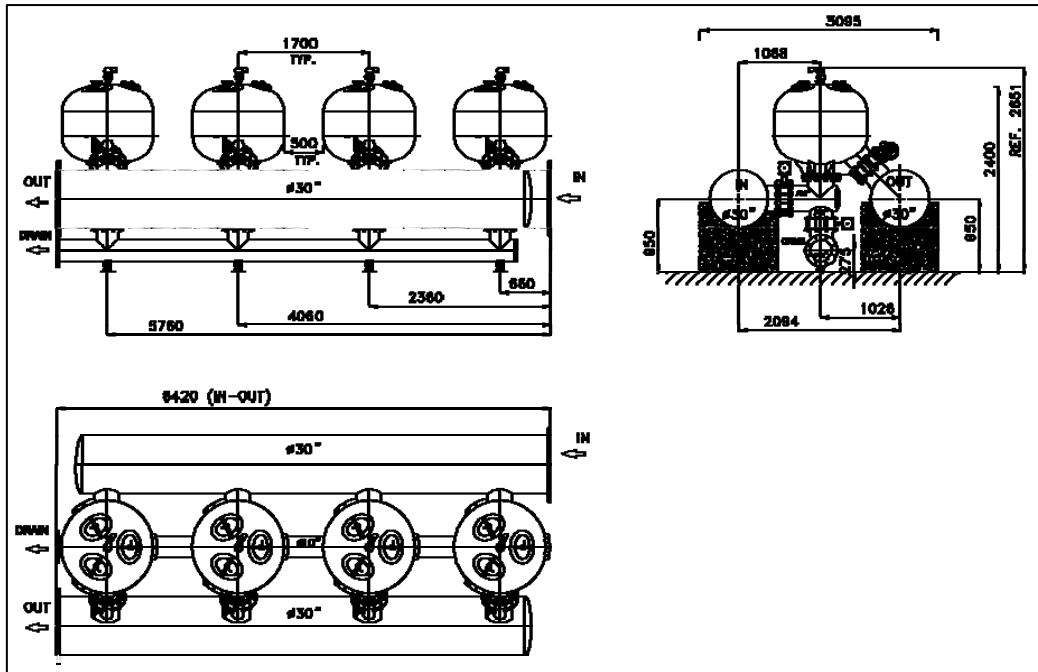
## Technical Data

Maximum pressure	10 bar	115psi
Minimum backwash pressure	3 bar	42 psi
Backwash flow rate per unit	500 m <sup>3</sup> /hr	2200 gpm
Filtration surface area per unit	44,880 cm <sup>2</sup>	6,955 in <sup>2</sup>
Filtration volume	68,000 cm <sup>3</sup>	4,150 in <sup>3</sup>
Maximum temperature	70°C	158°F

\* Please consult Arkal's engineering department.

## Galaxy Super Flow System

An example of 4 Super Flow filters system layout drawing (Stainless Steel 316 or Carbon Steel Polyester Coated)



### Installation

- Ensure that the inlet and outlet orientation is correct (shown by arrows on filter).
- Prior to start-up check for any transport damage to the unit (the system operates under pressure!).
- Connect backwash drainage line.
- Lids need to be properly closed and sealed.

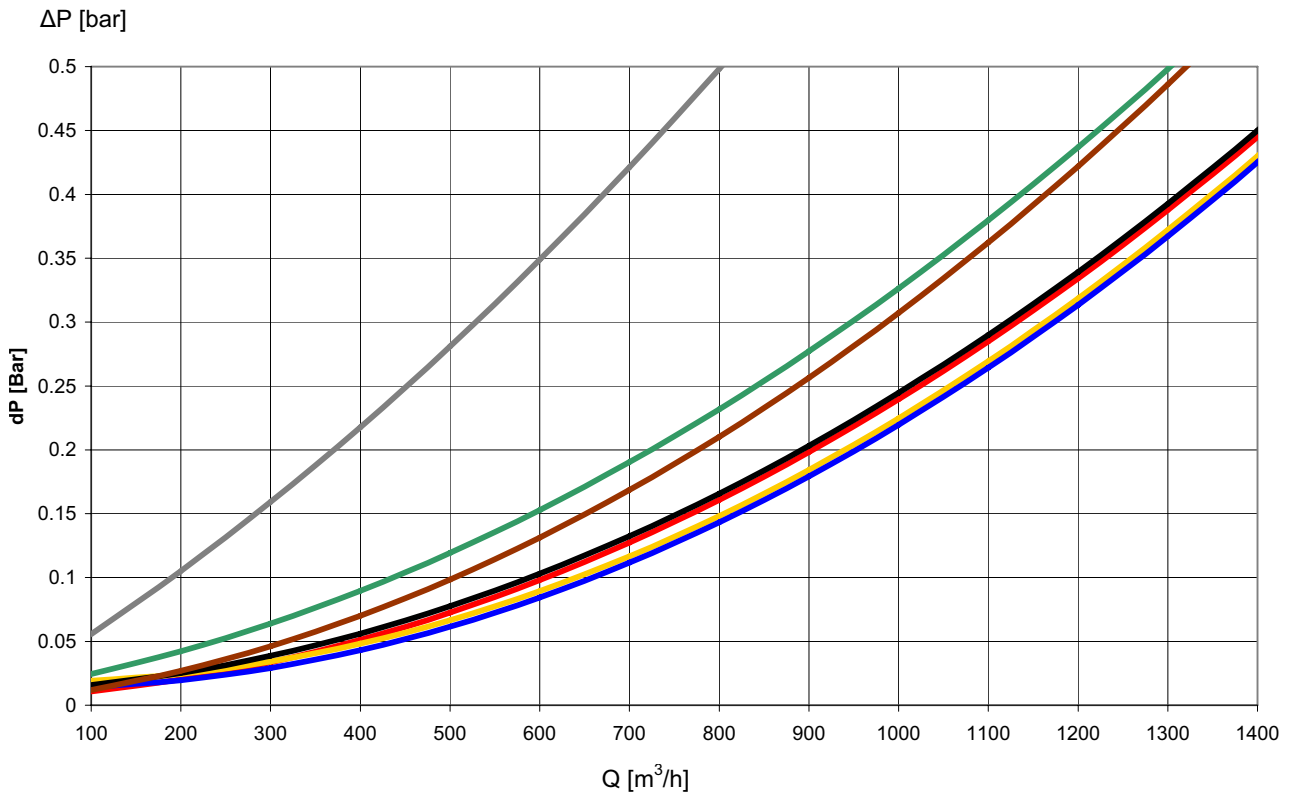
### Start-up Operation

Open the inlet valve. Start the backwash cycle, ensuring that all system components function correctly.

### Filter Load-up during Start-up

- Adjust the downstream (flow control) valve (if available) until downstream pressure reaches the recommended backwash pressure.
- Flush few cycles until clean, at least once for each filter.
- Slowly reopen the downstream valve.
- If the pressure difference remains high, check and see if the flow rate is too high. Excessive flow rate through the filter may increase pressure loss.

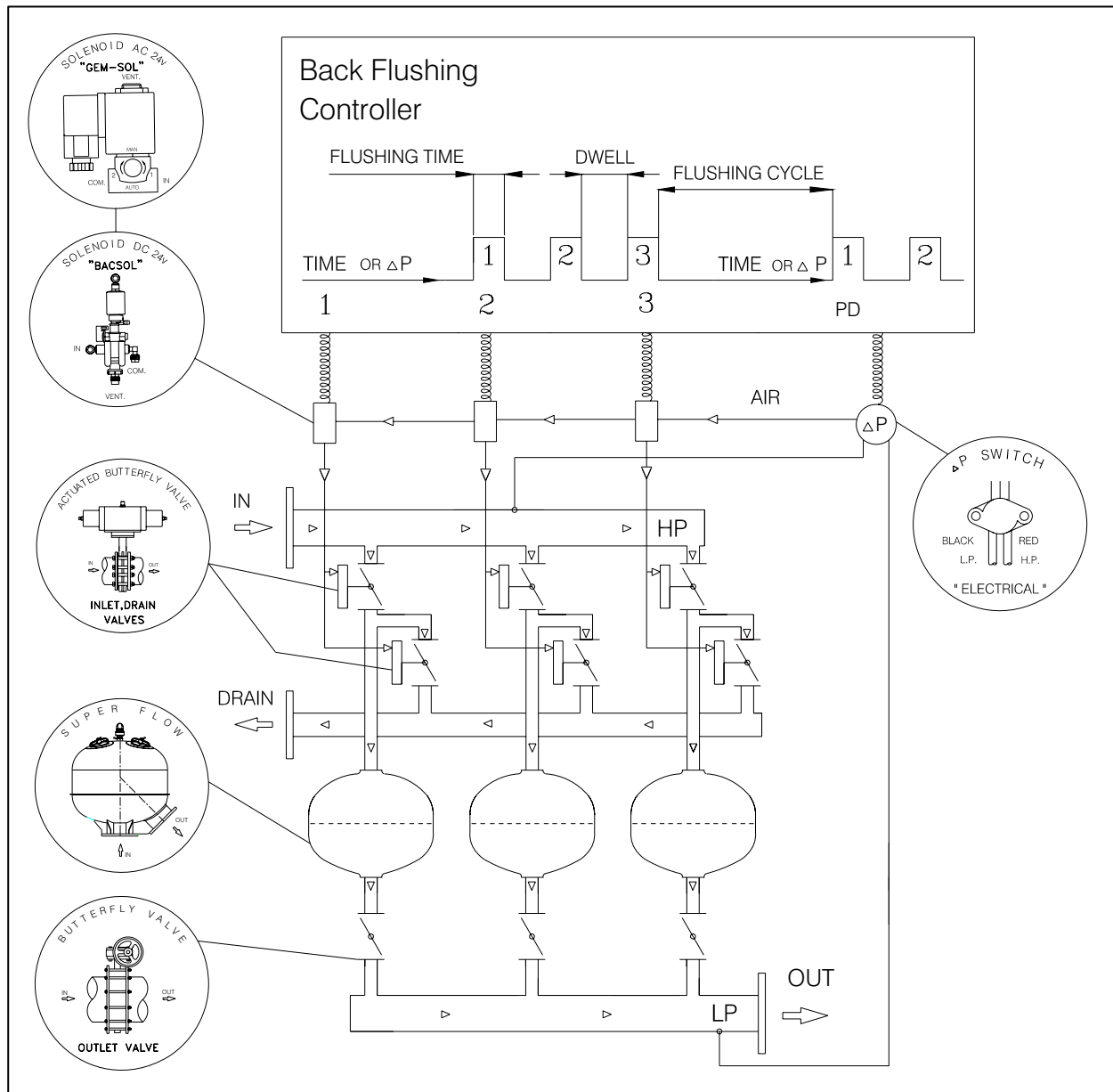
### Galaxy Super Flow Headloss Chart



### Filtration Grades

Color code	Blue	Yellow	Red	Black	Brown	Green	Gray
Micron	400	200	130	100	70	55	20
Mesh	40	80	120	140			

## Control system scheme



### Control

- ❑ Refer to the manufacturer's handbook before installing the controller (In case control system is supplied with the Galaxy Super Flow system).
- ❑ Ensure that the voltage of both the solenoid unit and controller is correct.
- ❑ Set the manual operation button to automatic.
- ❑ Check that the  $\Delta P$  hydraulic switch HIGH and LOW pressure lines are correctly connected to the right ports.
- ❑ Set the starting backwash switch to  $\Delta P$  of 5-7 meters (6 - 8psi).
- ❑ Set the controller to flush time of 20-30 seconds and dwell time of 10 seconds. These settings may require adjustment to conform to local water conditions. Normally, a 1 to 3 hour interval between backwashes is recommended.

## **Spin Klin - System Maintenance**

### **Check inlet /outlet pressure:**

If pressure differential is above 5 m / 7 psi:

Start the automatic backwash process of the Spin Klin Galaxy Super Flow filter.

In case that the pressure differential after backwash remains high check for possible failures.

### **Check for leakages from the drain manifold:**

In case there is a leakage of water during the filtration stage, check for possible failure at the valve.

### **Backwash controller performance:**

Check that the controller timing parameters are correctly adjusted and activate automatic backwash cycle. In the event of possible failure at the backwash controller, check for possible failures.

### **Water-formed deposits:**

During the filtration process, water-formed deposits may settle on the filtration discs and clog the filter.

The formation and composition of these deposits depend on the water quality and on environmental conditions like temperature, pH, light, flow velocity, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily by touch; beige, brown or green in color)
- Manganese or iron compounds (black, brown or orange deposits)
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend cleaning the filter periodically with a suitable cleaning solution. Make sure the cleaning solution is compatible with the filter materials.

## Seasonal Maintenance – Cleaning the Discs

To guarantee thorough cleaning the following steps should be taken:

Close the water inlet after backwashing the systems. **Make certain that there is no pressure in the system** and open the lids (Figure 1).



Figure 1

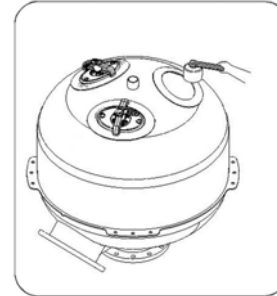


Figure 2

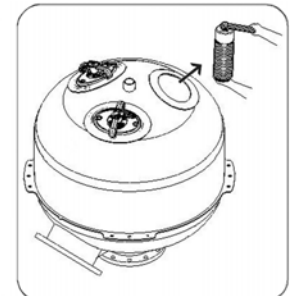


Figure 3

Unscrew the spine using a ranch with a special spine nut (Arkalg Catalog No. 5076 0097) and take out the spine out of the Super Flow vessel (Figure 3). Unscrew the butterfly nuts on the filtration elements (Figure 4). Remove the disc sets (for convenience we recommend using a plastic bag (Figure 5)).



Figure 4



Figure 5

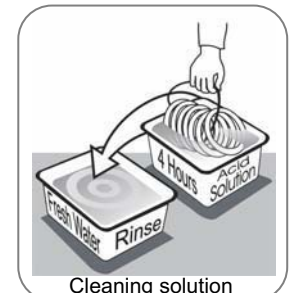


Figure 6

Tie each set on a string, place them in a suitable cleaning solutions, soak them for a few hours and then rinse them well with clean water to remove remaining deposits and chemicals (Figure 6).



Figure 7



Figure 8



Figure 9

Ensure that the correct quantities of discs are assembled on the spines: when the discs are pressed with two hands, the top disc should be level with the imprinted lines on the outside of nozzles pipes. Reassemble the tightening cylinders into the spines (Figure 7), screw back the spines into their seats and seal the vessels ports by the lids (Figure 8, 9).

### Attention:

When carrying out any seasonal maintenance, service, or cleaning of the discs – after backwashing the system and closing the water inlet, make certain that **there is no pressure in the system!**





**Optional (should be added to specific customers only):**

Suitable cleaning solutions for cleaning filtration discs outside the filter:

For biological deposits (biofilms) - up to 5% chlorine (NaClO) or peroxide (H<sub>2</sub>O<sub>2</sub>) solution

For organic deposits - up to 5% detergent solution (based on NaOH)

For manganese deposits - up to 10% citric acid solution

For iron and carbonate deposits - up to 5% acid solution (as HCl or H<sub>3</sub>PO<sub>4</sub>)

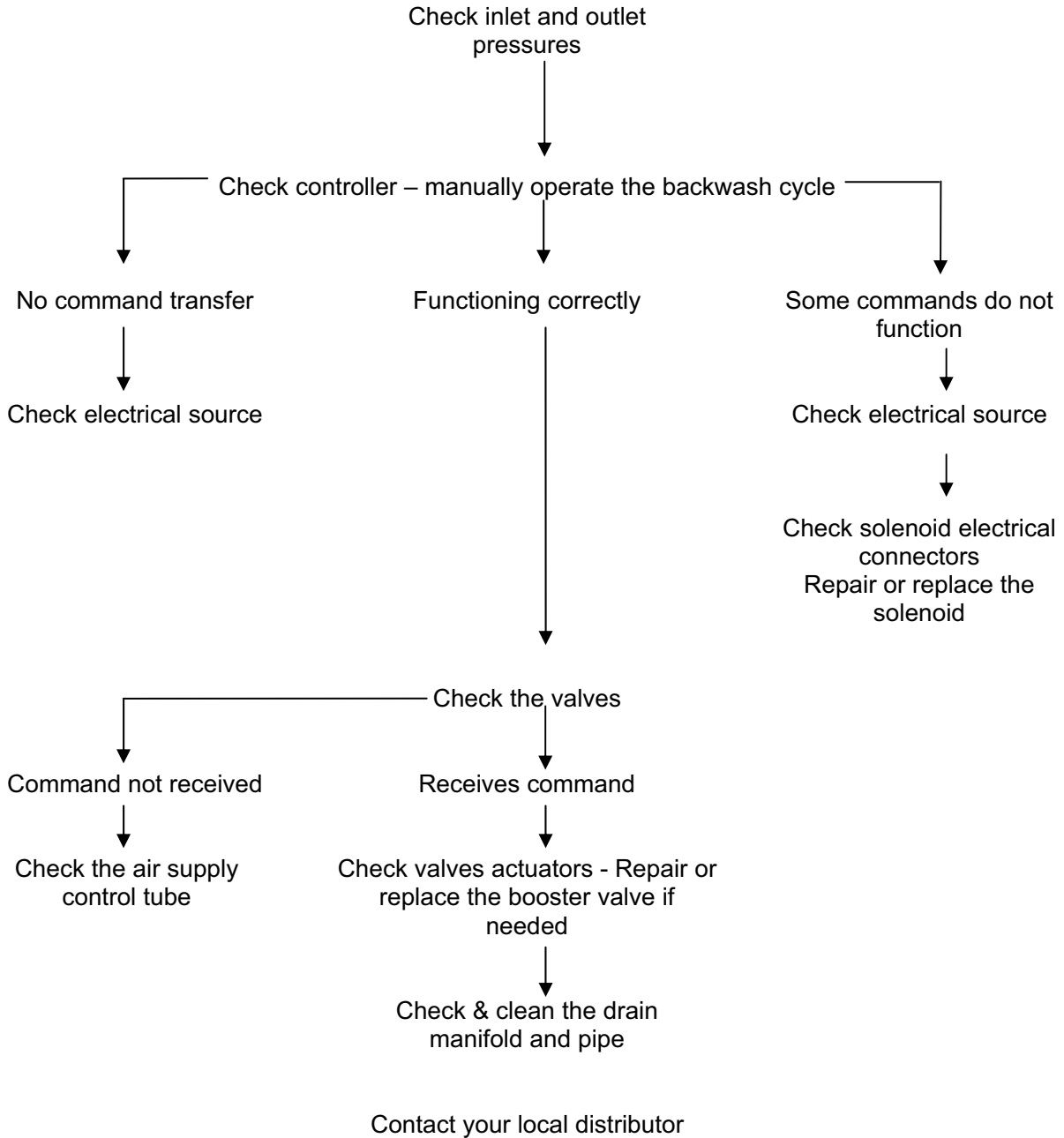
Do not expose filtration discs to chemicals longer than absolutely necessary (max. 4 hours).

For your personal safety, strictly follow the safety instructions of the chemical supplier.

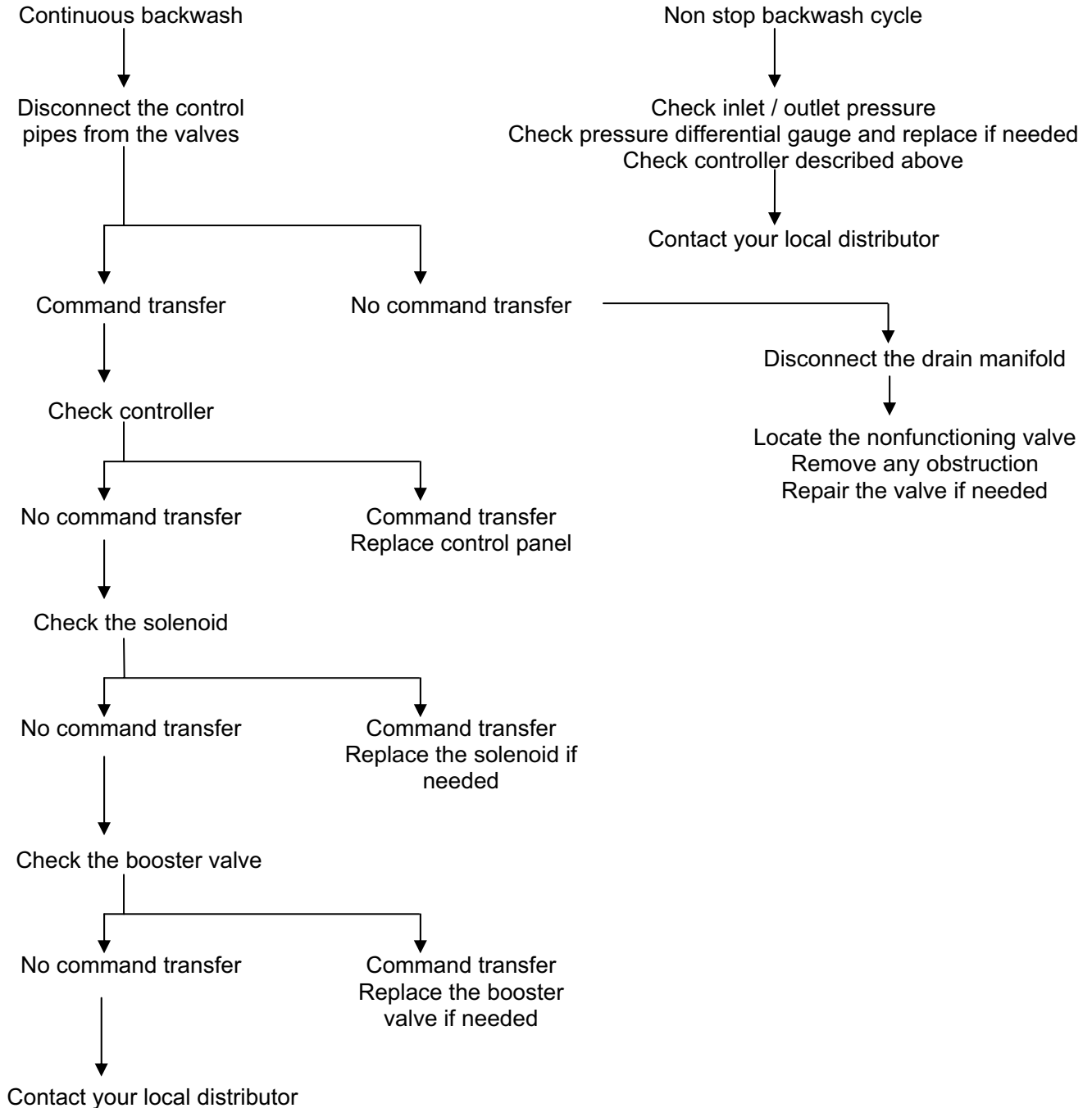
For online cleaning procedures, please contact your ARKAL consultant.

## Identifying Malfunctions in the Galaxy Super Flow system

### No Backwash Operation

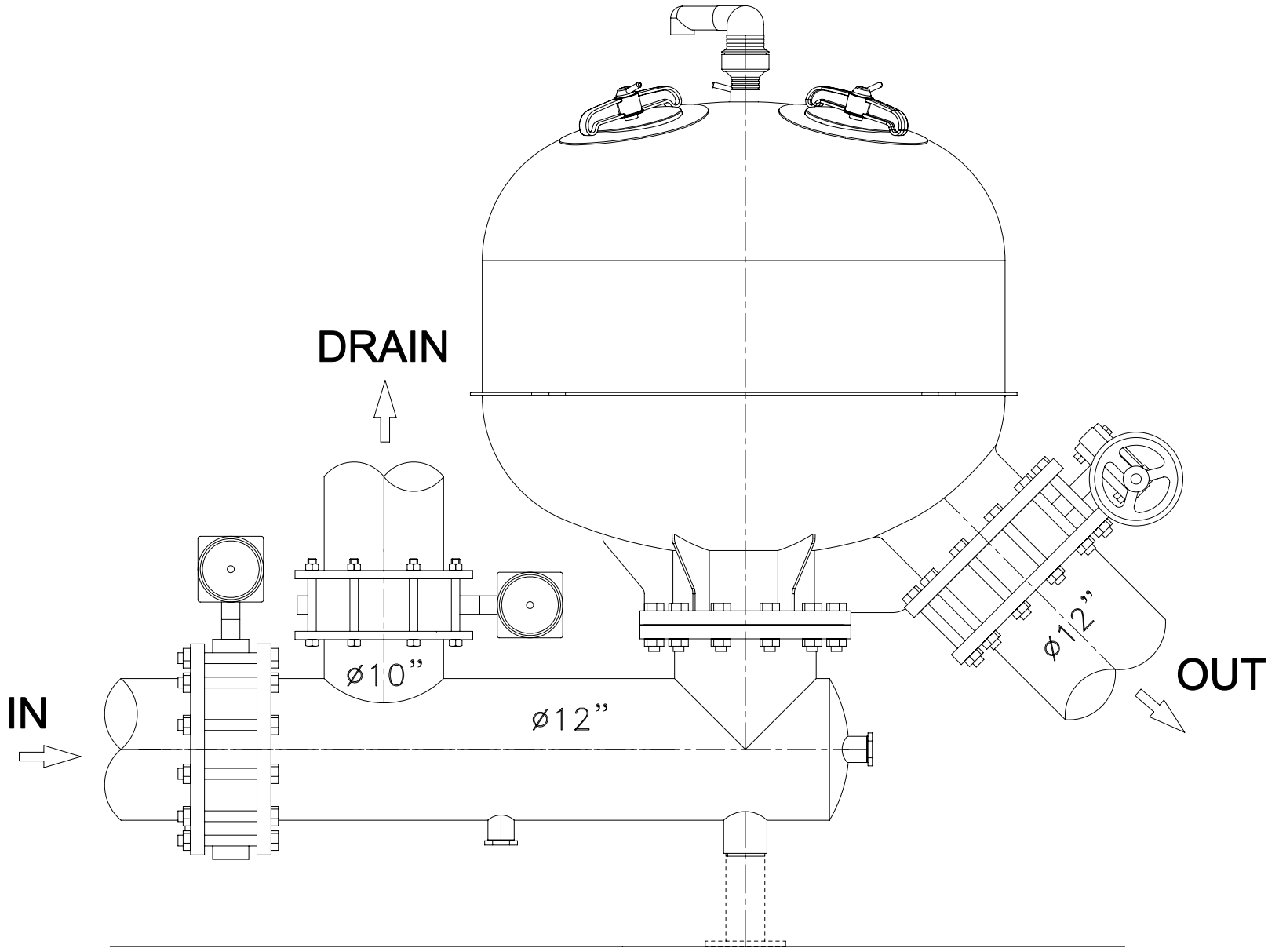



## Continuous or Non-stop Backwashing

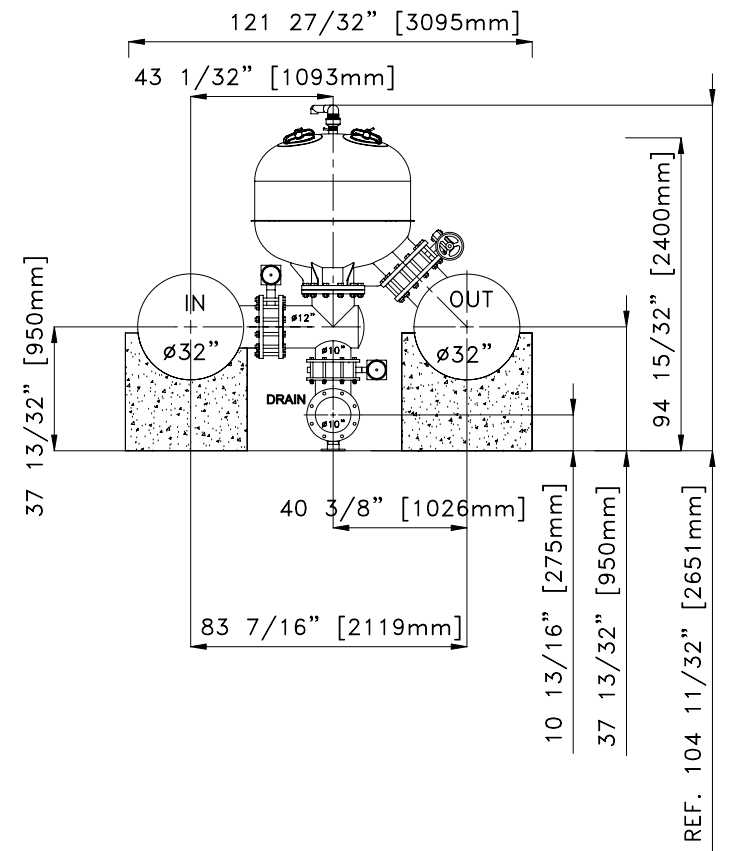
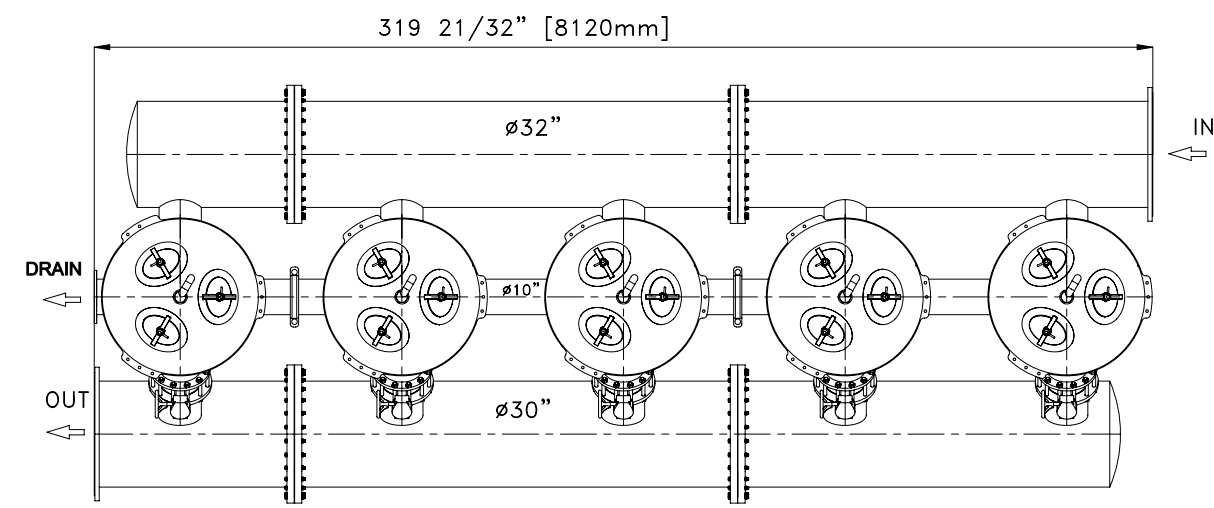
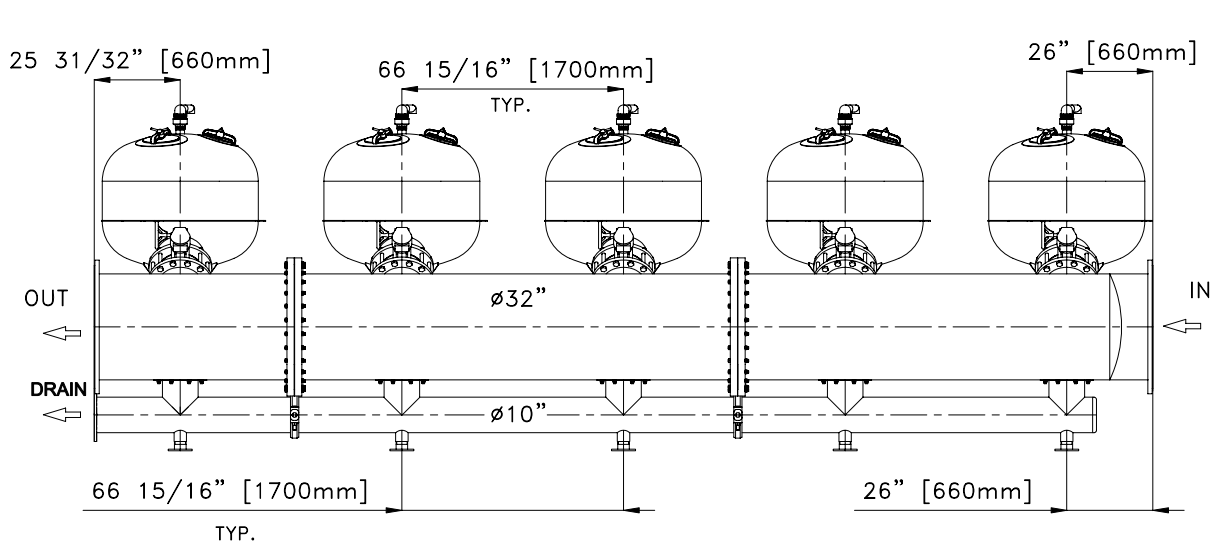


# Drawings

## 12" Spin Klin super flow Batteries



THIS DRAWING CANCEL DRAWING FROM 29.11.04		SIGN.	
MODIFIC.	DATE	DESCRIPTION	SIGN.
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		TITLE	ASSEMBLY DRAWING
PATH BATERIES\SUPER FLOW		FILE CODE	NAME
		1780H1201_50003	IRINA 28.01.07
DRAWN		DATE	DATE
MAY 28.01.07		5780 1201_50003	BACKUP: DISK-32
CHECKED		VIEW	FRONT & SIDE VIEW
NIKOLAY 28.01.07		FILE CODE DRAWING OF MANIFOLD:	DRAWER N: 5050
APPROVED		VIEW	
EYAL 28.01.07			



  
**ARKAL**  
 FILTRATION SYSTEM  
 BET-ZERA 15135  
 TEL. 972-4-6775140  
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 ISRAEL

PROJECT		5 SUPER "GALAXY" FILTERS BATTERY			PAGE <u>1</u> OF <u>3</u>
TITLE		ASSEMBLY DRAWING			CATALOGUE No: 1482 7BL
PATH BATERIES\SUPER FLOW		FILE CODE	NAME	DATE	SIGNATURE
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CHECKED	DOTAN	01.03.06	VIEW		DRAWER N:
APPROVED			FRONT, TOP & SIDE VIEWS		5050