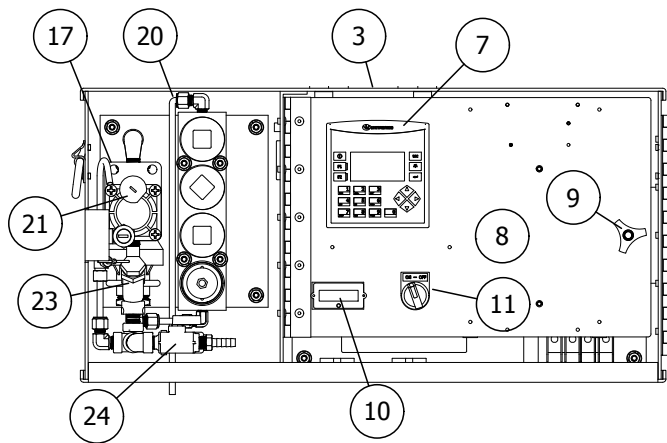
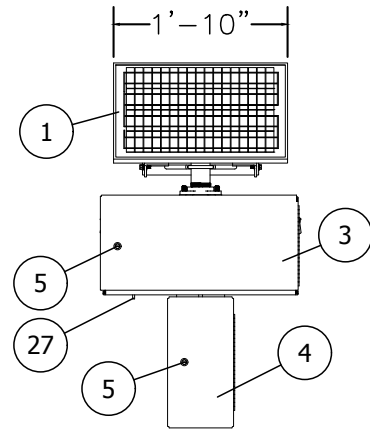


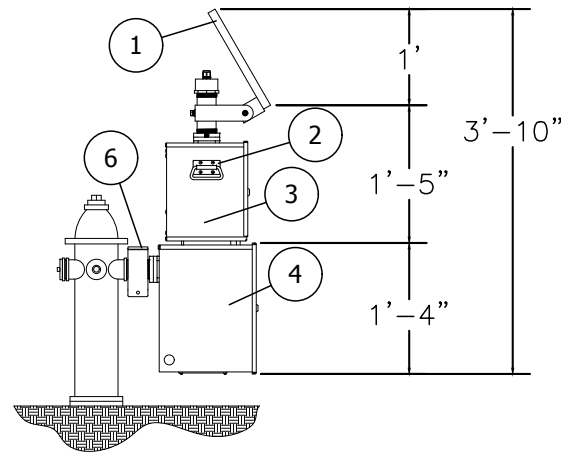
# #9700i SOLAR POWERED PORTABLE INTELLIGENT FLUSHING DEVICE



**A P&C BOX (OPEN)**  
Scale: 1-1/2"=1'-0"



**1 FRONT VIEW**  
Scale: 1/2"=1'-0"

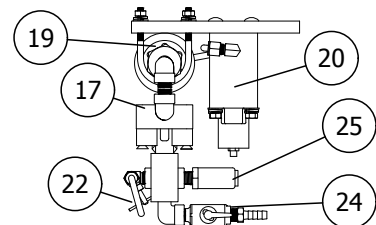


**2 SIDE HYDRANT MOUNT**  
Scale: 1/2"=1'-0"

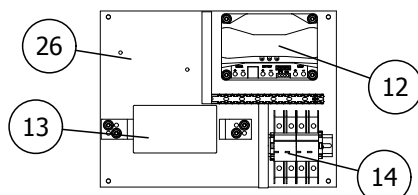
i-Series Product Ordering Guide										
MODEL#	9700i	WC	24LIS	0	X	X	X			
SUBSECTION	1	2	3	4	5	6	7	8	9	10
SUBSECTION DESCRIPTION	MODEL #	OPTIONS		DESCRIPTIONS						
MODEL	1	9700i		PORTABLE i-SERIES HYDRANT						
CLIMATE	2	WC		WARM CLIMATES						
POWER	3	24LIS		24 VDC, 10 AMP HOUR LITHIUM ION BATTERY w/ SOLAR CHARGING						
DEPTH OF BURY	4	0		N/A						
		X		NONE						
		A		CELLULAR (RV50 GATEWAY & ANTENNA)						
		B		ALARM INDICATION LIGHT						
		C		ETHERNET CARD ADDED						
		D		SECOND SERIAL CARD ADDED						
BACKFLOW PREVENTION	6	X		N/A						
PRESSURE SENSOR	7	X		NONE						
		A		ANALOG 0-200.0 PSI SENSOR						
CHOOSE UP TO 4 SENSORS FOR SUBSECTIONS 8-11. LEAVE UNUSED SUBSECTIONS BLANK										
SENSORS	8 - SENSOR #1	A - FREE CHLORINE		F - ORP						
	9 - SENSOR #2	B - COMBINED CHLORINE		G - CONDUCTIVITY						
	10 - SENSOR #3	C - TOTAL CHLORINE		H - DISSOLVED OXYGEN						
	11 - SENSOR #4	D - pH		I - FLUORIDE						
		E - TURBIDITY		X - CUSTOM (CALL)						

GENERAL SENSOR SPECIFICATIONS	
VOLTAGE:	BUS POWER (5 VDC)
COMMUNICATIONS:	SERIAL 485
CONNECTIONS:	MB-5 IP67/68
CHLORINE SENSOR SPECIFICATIONS	
MEASURING RANGE:	0.00 to 5.00 PPM
WETTED MATERIALS:	PVC, TEFLON, VITON, EPDM, RYTON®
RESOLUTION:	0.01 PPM
POWER:	40 mW
WATER TEMPERATURE SPECIFICATIONS	
MEASURING RANGE:	23 TO 131°F
TEMPERATURE INPUT:	PT100 RTD W/ AUTOMATIC COMPENSATION
ELECTRICAL SPECIFICATIONS	
VOLTAGE:	24 VDC
BATTERY SIZE:	10 AMP HOURS
CIRCUIT BREAKERS:	2 POLE, 10 AMP, MCB
SOLAR PANEL:	20 WATTS
PLC SPECIFICATIONS	
OPERATING VOLTAGE:	20.4 - 28.8 VDC
POWER CONSUMPTION:	215 mA @ 24 VDC
INPUTS:	(10) 24 VDC
ANALOG INPUTS:	(2) : 10-BIT RESOLUTION, 4-20 mA
OUTPUTS:	(6) : INDIVIDUALLY ISOLATED RELAY
NON-VOLATILE MEMORY:	120K DYNAMIC DATA
REMOVABLE MEMORY:	STANDARD MICRO SD CARDS (UP TO 32 GB)
COMMUNICATIONS:	RS-232 OR RS 485 PORT AND OPTIONAL ETHERNET/IP
OTHER SPECIFICATIONS	
MAX PRESSURE:	100 PSI
SAMPLE FLOW RATE:	UP TO ~3 GALLONS PER HOUR
FLUSH FLOW RATE:	UP TO ~220 GPM
WEIGHT:	~75 LBS
MINIMUM TEMPERATURE DESIGN:	5°C OR 41°F

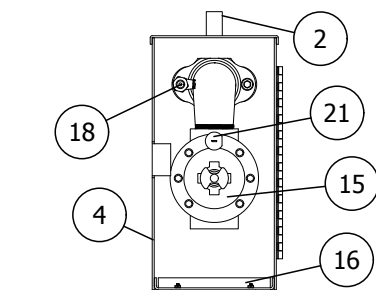
OTHER SPECIFICATIONS AVAILABLE UPON REQUEST



**B P&C BOX (SAMPLING)**  
Scale: 1"=1'-0"



**C P&C BOX (ACCESS OPEN)**  
Scale: 1"=1'-0"



**D VALVE BOX (OPEN)**  
Scale: 1"=1'-0"

*Intelligent Flushing Device* (IFD) shall be attached to hydrant in the following location(s): \_\_\_\_\_

A 2-1/2" NST swivel connection will lead into a flushing enclosure with a 2" flushing valve. The flushing valve shall control the flow of water through the hydrant and its diaphragm with the extension and retraction of a DC latching solenoid. A tap leading to a 1/4" brass hydraulic fitting shall be located before the valve to provide water through a hose to the sampling assembly located in the power and control enclosure. A removable floor plate shall allow access, if needed, to a 2" FIP outlet. Discharged water exiting the enclosure shall be diffused via the 5/8" perforations in the floor.

The power and control enclosure shall mount to the top of the flushing enclosure, utilizing a pair of attachment bars, binding the enclosure together. A sampling hose shall be used to pass through enclosures connecting to the hydraulic fitting in the flushing enclosure to allow the flow of water into the sampling assembly. The hose shall continue to a ball valve controlling the flow of water through the sampling assembly. From the ball valve, a copper gooseneck sampling point shall be provided to allow a dedicated sampling point. A Y-strainer shall be located immediately after the sampling point for maintenance purposes. A sampling valve shall be included to control the flow of water through the IFD with the extension and retraction of a DC latching solenoid. Both solenoids shall have no loose parts when removed from the valve. The sampling valve shall control the flow of water through a pressure regulating valve (PRV) to a node based flowcell that can house up to 4 plug-and-play sensors. The sensors shall be serially (RS485) connected to a hub and then to the PLC. The included chlorine sensor shall be amperometric using a membrane sensor which measures chlorine directly without the use of reagents. From this flowcell, the water will plumb away through 1/4" copper tubing out the bottom of the enclosure and be at the customer's discretion as to how they want the water to drain. The sample used for water quality monitoring shall not be altered by adding any chemicals or reagents to the sample stream.

The IFD to be installed on the water lines mentioned above shall use a Unitronics PLC to control the intelligent blow-off of water to maintain chlorine residual levels while collecting data into local data tables (viewable at the site) and/or a removable micro SD card in a .CSV file (removable and viewable in Excel). The IFD shall have the capability to monitor either the free, combined, and/or total chlorine levels in a water distribution system. The unit shall also allow the user to manually flush water from the line with the simple push of a button or unthreading of the solenoid, allow a maximum of 8 intelligent sampling times per day, have a max flush length per sampling time, and allow the end user to program the desired and minimum chlorine levels.

Unit shall be upgradeable to use a Sierra Wireless RV50 wireless gateway commissioned through the customer's cellular plan (Sprint, Verizon, AT&T, etc.). The RV50 shall forward the information from the PLC to the cellular network where it may be controlled and/or accessed by the customer on a device (phone, laptop, etc.) that can connect to the internet. Firewalls and security to be coordinated between Kupferle and the end user.

The enclosures shall be powder coated and include security mounting and locking features as well as a front opening door with a captive screw cover. The front panel of the power and control enclosure with the PLC shall swing open to allow for maintenance, data retrieval, and/or manual battery charging if required. The solar panel shall mount on top of the control enclosure and shall be rotatable (directed southwest when installed) and be positioned to provide for maximum solar hours. Battery shall be 24 V Lithium Ion with 10 Amp Hours of available power and shall utilize a battery capacity gauge for easy indication of the battery charge. Photovoltaic solar panel shall provide 20 Watts of charging power to the battery through a charge controller. Two, 2 pole 10 amp, circuit breakers shall be used to allow disconnection of the photovoltaic solar panel and the battery. Additional grounding/lightning protection may be needed. The solar package is sized for the 9700-i hydrant only. If the hydrant is upgraded to include communications for SCADA, other than the RV50 option, additional power may be needed.

Unit model # shall be 9700i (see ordering guide for detailed ordering information) as manufactured by Kupferle Foundry Company, Saint Louis, MO, or approved equal.

ITEM	DESCRIPTION
1	SOLAR PANEL ASSEMBLY
2	HANDLE
3	POWER & CONTROL ENCLOSURE (P&C BOX)
4	FLUSHING ENCLOSURE (VALVE BOX)
5	CAM LOCK
6	2-1/2" NST SWIVEL W/ LOCKING COLLAR
7	PROGRAMMABLE LOGIC CONTROLLER (PLC)
8	HINGED CONTROL PANEL
9	CONTROL PANEL WING KNOB
10	BATTERY CAPACITY GAUGE
11	ON/OFF SWITCH
12	CHARGE CONTROLLER
13	24 VDC LITHIUM ION BATTERY
14	CIRCUIT BREAKERS
15	2" FLUSHING VALVE
16	REMOVABLE ACCESS PLATE
17	SAMPLING VALVE
18	HYDRAULIC SAMPLING CONNECTION
19	PRESSURE REDUCING VALVE
20	NODE BASED FLOWCELL
21	DC LATCHING SOLENOID
22	DEDICATED SAMPLING POINT
23	Y-STRAINER
24	BALL VALVE & HOSE CONNECTION
25	OPTIONAL PRESSURE SENSOR
26	OPTIONAL RV50 WIRELESS GATEWAY
27	DRAIN

**NOTES:**

1.) NOT ALL WIRES AND PIPING SHOWN FOR CLARITY PURPOSES.

DD/MM/YY	ISSUED FOR ...
DATE	STATUS / REVISION

	INITIALS	DATE
DRAWN	JRG	2/1/18
APPROVED	DCL	8/1/18
MODIFIED		

9700i SOLAR SPEC

SHEET SIZE  
B (11x17)

SCALE  
VARIOUS



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