

Technical introduction

LWM20 loss-in-weight feeder is suitable for feeding and metering of low and high viscosity liquid raw materials.

LWM20 can be combined with other Sonner metering systems, suitable for continuous metering production Process, such as compounding granulation, food and chemical production process.

Optimized modular design for both volumetric feeding and loss-in-weight metering feeding makes the whole system more adaptable to the change of customer's processing formula.

Based on the loss-in-weight principle, LWM20 continuously monitors and closes the flow of raw materials to ensure the typical accuracy value is better than $\pm 0.5\%$.

LWM20 silo is made of stainless steel, and the part in contact with the raw material is mirror polished;

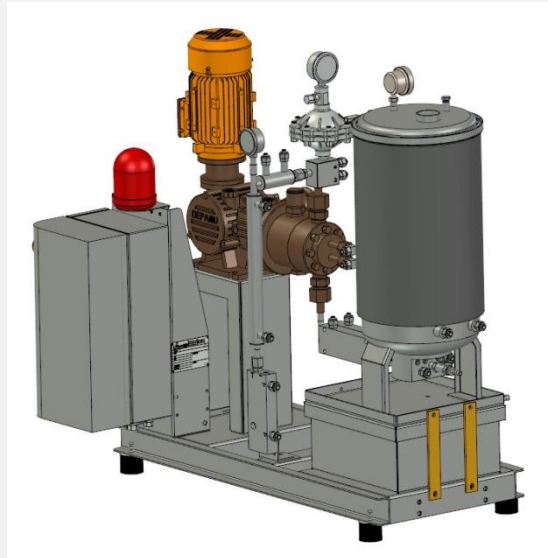
LWM20 pipes and components are made of stainless steel.

LWM20 can provide different types of metering pumps to adapt to feed various liquids;

LWM20 can provide thermal insulation design according to liquid feeding requirements.

LWM20 has obtained the European CE safety design standard certification.

The electronic controller has undergone strict EMC standard test.



Metering pump and feeding range

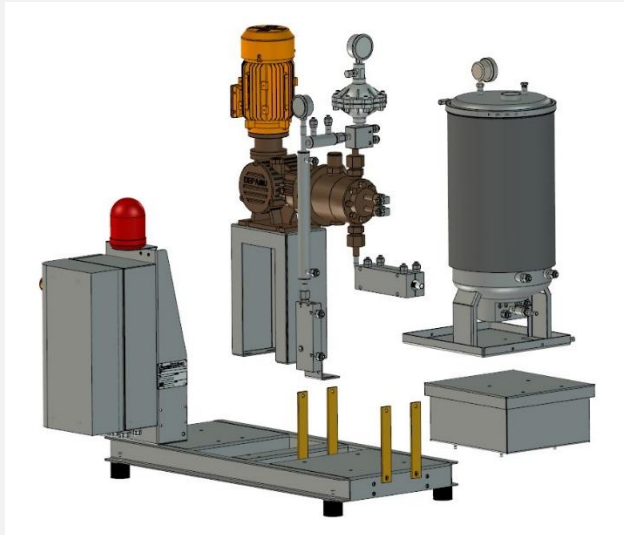
Note: The correct selection of metering pumps is based on specific raw materials which is fully tested to confirm. The feeding data in the following table is a theoretical reference value and can only be used as a reference for selection. Different raw material characteristics determine the actual feeding range, if you need a specific and accurate feeding range, please provide us with raw material details, we can find and confirm them in our Laboratory test

	14 Metering Pump	40 Metering Pump	75 Metering Pump	--
Flow Range	1.4 – 14L/hr	4– 40L/hr	7.5 – 75L/hr	--
Pressure Range	4Mpa	4Mpa	4Mpa	--
Plunger Diameter	18mm	30mm	40mm	--
Stroke Range	9 - 90 P/min	9 - 90 P/min	16 - 160 P/min	--
Motor Power	0.37kw	0.37kw	0.55kw	--

Material	Pump Type	1	2	3	7	13	14	35	40	45	60	65	75	Kg/h	
Silane	D14	Yellow													
Silane	D40		Green												
Silane	D75			Blue											
DCP	D14	Yellow													
DCP	D40		Green												
DCP	D75			Blue											
White Oil	D14	Yellow													
White Oil	D40		Green												
White Oil	D75			Blue											

Standard structure

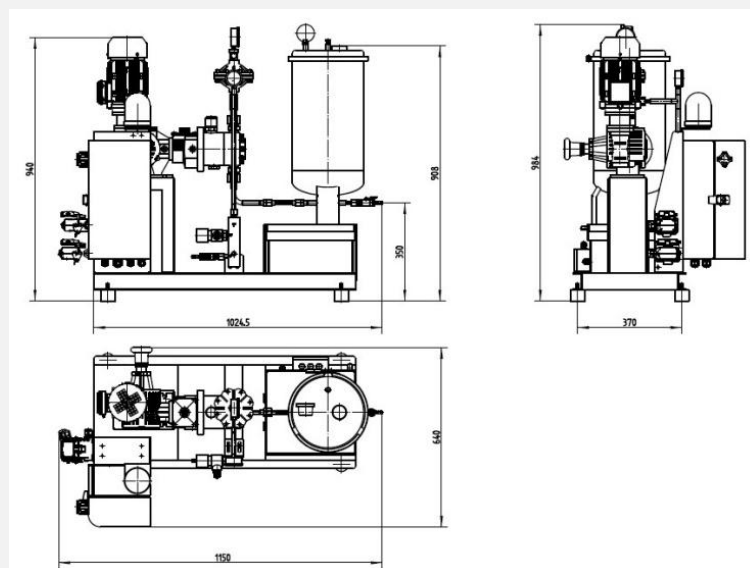
Dosing Hopper	20L SUS304 Warm Hopper Selection
Feeding Unit	Hydraulic Diaphragm Metering Pump Diaphragm material PTFE Pump body material 304 standard Pump body material 316 optional Pump head warm optional Pulsation damper Safety valve Pressure meter
Weighing unit	75kg Range
Rack Unit	Stainless Steel SUS304



Design Parameters

Material	: Raw material Contact part: Stainless steel
Sealing parts	: Silicone or PTFE
Material temp	: $\leq 80^{\circ}\text{C}$: High Temperature Optional 150°C
Ambient temp	: $0^{\circ}\text{C}-50^{\circ}\text{C}$
Ambient humidity	: $\leq 80\%$
Protection class	: IP54
Power Supply	: $380\text{V}\pm 10\%$, AC, 3P, 50Hz
Loading power	: 0.7KW (Max.)
Weight	: 130kg
Appearance color	: RAL7035

Mechanical dimension drawing



Nonstandard design

Silo material	Optional stainless steel 316 material, mirror polished inner surface
Explosion-Proof design	Zone 21, Dust Explosion Proof, EXIIBT4 (Nanyang Explosion Motor, Explosion load cell)

Paid Spare Parts List

Material Name	Model specifications	Part code
Diaphragm	D14/D40/D75-PTFE	4400DP000000001
One-way valve	Inlet/Outlet one-way valve	4300HW000000151
Pulsation damper	HLMZ-MS0.35-5.0	4300V1000010002
Safety valve	R3/8"PT-DN10-SUS304-PN6MPa	4300V1000010001
Counter balance valve	Rc(i)/R(o)3/8"PT-DN10-SUS316-PN6MPa	4300V1000010009
Pressure Meter	YN60BF-10MPa-R1/4"-SUS304	4300V1000010003
Thermometer	WSS311W-L300-R1/4"-150°C-SUS304	4300V1000010006
AC inverter	DV1-341D5NB-C20CX1	4400ID000400001
AC inverter	DV1-343D0NB-C20CX1	4400ID000750001
LIW control panel	EC-LW	4110ECLW0STM32000102

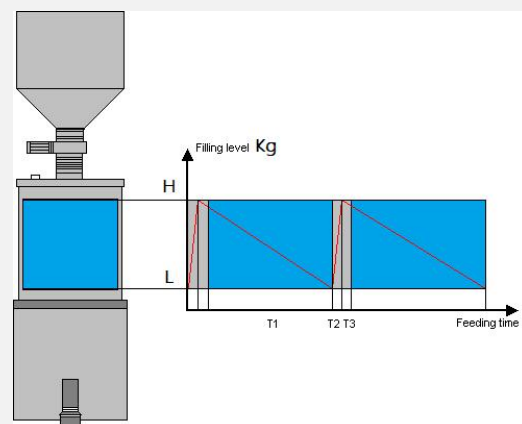
Associated Configuration

7" HMI Operation Controller	M240 HMI Operation Controller
12" HMI Operation Controller	M280 HMI Operation Controller
Communication Module	TS180 Modbus RTU ->Profinet
40L Refill Hopper	ICHL40
40L Refill Hopper	ICHL40-HP
Refill Valve	IEV20 20mm Ball Valve
Refill Pipe	IDO20
Injection Nozzle	PQ075-X-00
Connection Pipe	LCO10-3/8" – L2.5M Quick Connect Tube between Feeder and Injection Nozzle

Loss-In-Weight-Refill Control Time

Typical Refill Number as below form:

Typical Maximum Capacity	75Kg/hr
Diameter of Refill valve	20mm
Volume of Dosing Hopper	20L
Bulk Density	0.9kg/l
Typical Refill Weight	14.4Kg
Refill Number	≤15 times/hr



Feeding Accuracy

Sampling Measurement	Usually take 15 samples and 60s for one sample (If need Special Requirement, please reference below accuracy form for 5s/10s/15s/30s)
Feeding Range	15: 1 Times Screw
Linear Accuracy	±0.25%-0.5% at 60sec
Repeatability Accuracy	≤0.5% at 2 Sigma, Flow Characteristics of Material Determine Repeatability Accuracy


Repeatability Accuracy:

It is based on the standard sample variance, which describes the flowrate of the screw feeder in a period of time and the discrete situation of several flow samples in each sampling period. It is one of the important indicators to describe the repeatability error of the screw feeder. The repetition error can be quantified based on the standard deviation.

Linear Accuracy:

It describes the accuracy of each operating point with in the operating range of the feeder from the minimum federate to the maximum feed rate. That is the error between the actual feeding amount and the set amount in the whole range. Smaller the error higher is the linear accuracy of the feeder.

D40 Typical Accuracy Testing Table



Accuracy Test Report

Customer And Feeder Information

Customer:	Order No.:
Feeder Type: LWM20-20L	SN.: SH31024402
Screw: 55L/H	Scale: 75
Speed Range(rpm/min): 14-140	Motor(kw): 0.75

Material

Name: WATER	Shape: Liquid
Fluidity: Good	Bulk Density(kg/l): 1

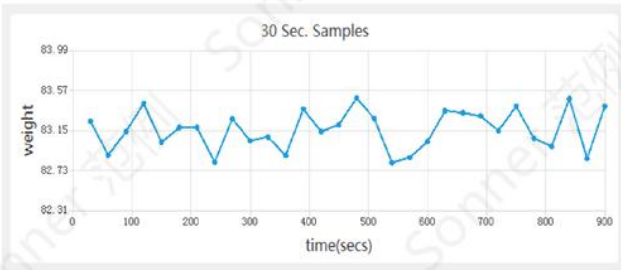
Running

Setpoint(kg/h): 10	Actual Current(A): 1.2
Screw Speed(rpm): 25.35	Feeder Factor: 6.5
Test Time: 2024-07-26 15:24:59	Test Person: Wuzhiping

Measuring Result

Sample(S)	5	10	15	30	60	120
No.	180	90	60	30	15	7
S dev(g)	0.210	0.194	0.183	0.206	0.253	0.278
S dev(%)	1.511	0.700	0.441	0.247	0.152	0.084
2S dev(%)	3.023	1.400	0.882	0.494	0.304	0.167
Mean(g)	13.879	27.751	41.604	83.157	166.341	332.669
Setpoint(g)	13.889	27.778	41.667	83.333	166.667	333.333
SP dev(%)	-0.073	-0.095	-0.150	-0.212	-0.196	-0.199

30 Sec. Samples



60s Samples

166.074	166.055	166.448	166.148	166.295
166.530	166.241	166.759	166.674	166.443
166.290	166.115	165.907	166.518	166.612

Shanghai Sonner Intelligent Equipment Co., Ltd
www.sonnerfeeder.com
Version: V1.0

Weighing Accuracy

Weigh Module	SP4-75
Load cell Range	75Kg
Protection Class	IP65
Comprehensive Error	< $\pm 0.03\%$
Weighing Resolution	1: 4'000'000
Operating Temperature	-10 to +60 °C
Weight Signal Output	Digital Output Signal Via RS485
Baud Rate Range	9600 – 38400 baud
Sampling time	6ms – 4500ms programmable
Voltage	24VDC
Communication distance	< 500m
Operational characteristics	10ms dynamic weighing scanning cycle; 32-bit DSP high-precision weight calculation
Interference characteristics	Intelligent assessment of impact disturbance, the impact of continuous vibration disturbance on feeding operation
Suspension characteristics	Double shock absorber anti-mechanical interference design

The second generation of Sonner has completely independent intellectual property rights of weighing technology, based on 32-bit. DSP arithmetic function chip circuit design and perfect dynamic scale. Weighing software provides customers with highly dynamic weighing technology.

