

Best for Crystallization Process Development!

Katsuragi's Bench Scale Crystallizer

We, Katsuragi Industry Co., Ltd. have been engaged in design and manufacture of various scale and type of crystallizer based on a long term experience of Crystal Engineering Co., Ltd. We are pleased to release the bench scale crystallizer of effective volume as 3 lit. Stainless steel made pilot scale crystallizers of effective volume from 50 to 500 lit. have been commonly used for process development. As a preliminary stage, however, the new bench scale crystallizer can measure MSZW and crystal growth rate and make various mode of operation, such as batch or continuous, by having glass made jacketed flask.

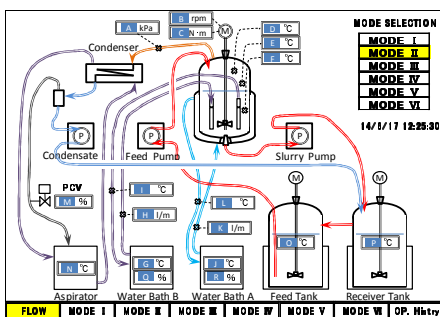
Features

- Operation mode, such as batch or continuous, direct or vacuum cooling, concentration crystallization, can be selected on a touch panel.
- Any temperature difference by heating or cooling can be made locally. Scaling and nucleation can be observed from outside of the crystallizer.
- Draft tube and impeller of agitator can be changed. Influence on crystal quality by agitation can be observed.
- Pressure and temperature is PID controlled. Data of temperature, pressure, flow rate rotation speed and power can be stored.

Photo Left
: Front view of the crystallizer

Photo Right
: 3 lit. crystallizer

Figures Below
: Touch panel screens
1. Flow sheet
2. Mode I to VI
3. Operation history



MODE I : Batch-wise Indirect Cooling Mode 14/8/17 12:25:30

| | | | |
|---------------------|----------------------------|----------------------------|----------------------------|
| CRYSTALLIZER | HEATER PV [] °C | HEATER SV [] °C | HEATER MV [] °C |
| AGITATOR | RETURN Flow-rate [] L/Min | RETURN Flow-rate [] L/Min | RETURN Flow-rate [] L/Min |
| OPERATION | STEP SV TIME SKIP | STEP SV TIME SKIP | STEP SV TIME SKIP |
| START | Initial [] °C | Initial [] °C | Initial [] °C |
| STOP | STEP1 [] °C | STEP1 [] °C | STEP1 [] °C |
| Seeding | STEP2 [] °C | STEP2 [] °C | STEP2 [] °C |
| Nucleation | STEP3 [] °C | STEP3 [] °C | STEP3 [] °C |
| | STEP4 [] °C | STEP4 [] °C | STEP4 [] °C |
| | P I D | P I D | P I D |
| | 50.00 20.0 1.00 | 50.00 20.0 1.00 | 50.00 20.0 1.00 |

FLOW MODE I MODE II MODE III MODE IV MODE V MODE VI OP. Hstry

MODE V : Continuous Vacuum Evaporative Mode 14/8/17 12:25:30

| | | | |
|---------------------|----------------------------|----------------------------|----------------------------|
| CRYSTALLIZER | HEATER PV [] °C | HEATER SV [] °C | HEATER MV [] °C |
| AGITATOR | RETURN Flow-rate [] L/Min | RETURN Flow-rate [] L/Min | RETURN Flow-rate [] L/Min |
| OPERATION | Pressure PV [] kPa | Pressure SV [] kPa | Pressure MV [] kPa |
| START | P I D | P I D | P I D |
| STOP | 50.00 20.0 1.00 | 50.00 20.0 1.00 | 50.00 20.0 1.00 |

FLOW MODE I MODE II MODE III MODE IV MODE V MODE VI OP. Hstry

MODE III : Batch-wise Vacuum Cooling Mode 14/8/17 12:25:30

| | | | |
|---------------------|---------------------|---------------------|---------------------|
| CRYSTALLIZER | Pressure PV [] kPa | Pressure SV [] kPa | Pressure MV [] kPa |
| AGITATOR | STEP SV TIME SKIP | STEP SV TIME SKIP | STEP SV TIME SKIP |
| START | Initial [] °C | Initial [] °C | Initial [] °C |
| STOP | STEP1 [] °C | STEP1 [] °C | STEP1 [] °C |
| Seeding | STEP2 [] °C | STEP2 [] °C | STEP2 [] °C |
| Nucleation | STEP3 [] °C | STEP3 [] °C | STEP3 [] °C |
| | STEP4 [] °C | STEP4 [] °C | STEP4 [] °C |
| | P I D | P I D | P I D |
| | 50.00 20.0 1.00 | 50.00 20.0 1.00 | 50.00 20.0 1.00 |

FLOW MODE I MODE II MODE III MODE IV MODE V MODE VI OP. Hstry

MODE VI : MSZW & Crystal Growth Rate Measurement Mode 14/8/17 12:25:30

| | | | |
|---------------------|----------------------------|----------------------------|----------------------------|
| CRYSTALLIZER | HEATER PV [] °C | HEATER SV [] °C | HEATER MV [] °C |
| AGITATOR | RETURN Flow-rate [] L/Min | RETURN Flow-rate [] L/Min | RETURN Flow-rate [] L/Min |
| OPERATION | STEP SV TIME SKIP | STEP SV TIME SKIP | STEP SV TIME SKIP |
| START | Initial [] °C | Initial [] °C | Initial [] °C |
| STOP | Crystal [] °C | Crystal [] °C | Crystal [] °C |
| Seeding | Growth [] °C | Growth [] °C | Growth [] °C |
| Extinction | Reheat [] °C | Reheat [] °C | Reheat [] °C |
| | P I D | P I D | P I D |
| | 50.00 20.0 1.00 | 50.00 20.0 1.00 | 50.00 20.0 1.00 |

FLOW MODE I MODE II MODE III MODE IV MODE V MODE VI OP. Hstry

OPERATION HISTORY SCREEN 14/8/17 12:25:30

| DATE | OPERATION | GRG. TEMP. |
|------------------|---------------------|------------|
| 14/8/17 12:25:28 | MODE I START | 23.58 |
| 14/8/17 12:25:30 | MODE I SEEDING | 24.58 |
| 14/8/17 12:25:30 | MODE I NUCLEATION | 25.58 |
| 14/8/17 12:25:30 | MODE I STOP | 26.58 |
| 14/8/17 12:25:28 | MODE IV START | 27.58 |
| 14/8/17 12:25:30 | MODE IV NUCLEATION | 28.58 |
| 14/8/17 12:25:28 | MODE IV STOP | 29.58 |
| 14/8/17 12:25:30 | MODE VI NUCLEATION | 30.58 |
| 14/8/17 12:25:30 | MODE VI HEATING | 31.58 |
| 14/8/17 12:25:30 | MODE VI DISSOLUTION | 32.58 |
| 14/8/17 12:25:30 | MODE VI COOLING | 33.58 |
| 14/8/17 12:25:30 | MODE VI NUCLEATION | 34.58 |
| 14/8/17 12:25:30 | MODE VI NUCLEATION | 35.58 |

▲ SUMON ON SUMON OFF ▼

FLOW MODE I MODE II MODE III MODE IV MODE V MODE VI OP. Hstry

